

Rejuvenation

How Steinach Makes People Young

GEORGE F. CORNERS

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REJUVENATION

How Steinach Makes People Young



DR. EUGEN STEINACH

Professor of Biology, University of Vienna

REJUVENATION

How Steinach Makes People Young

BY

GEORGE F. CORNERS

WITH AN INTRODUCTION BY

A. S. BLUMGARTEN, M. D.



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NEW YORK

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PREFACE

WHY GROW OLD ?

THE publication of this book needs no explanation. It states in simple language, intelligible to any layman, what is known about Rejuvenation. A discovery that renews youth, even if it may not lengthen life, vitally affects every human being without exception. No man can afford to go on living without giving serious thought to the subject.

My observations are based on a study of Steinach literature, amplified by discussions with Professor Steinach himself, with Dr. Peter Schmidt, his chief German interpreter, with various students of Endocrinology in the United States, and by personal investigations of the cases of divers persons who were successfully Steinached.

Death and vulgarity, remarks Oscar Wilde, are the only things that cannot be explained away. While no living organism can ultimately escape Death, we can at least push back his kingdom. Science has discovered a charm to wean us from the vulgar habit of growing old.

Professor Eugen Steinach reveals three major methods of re-energizing the aging organism. Two involve the surgeon's knife, one uses the mysterious powers imminent in the Xray; a fourth method,

hinted at by Steinach's associate Kammerer, utilizes heat generated by electricity.

Rejuvenation is achieved by revitalizing the glandular system through the gonads or sex glands. The science of bio-chemistry is in its infancy. In time researchers may find other methods of stimulating the chemical agents upon which our vitality so largely depends. At present, Steinach's is the easiest way.

Steinach does not disavow the implantation of youthful glands, recommended by Voronoff and others. In fact, he frequently uses the method in his experiments with animals. For women, Steinach prefers the Xray. This method is entirely bloodless. The same method is frequently used in accomplishing the rejuvenation of men. In their case, however, he favors the Steinach operation, a slight, if delicate, incision, remarkable alike for its effectiveness and its simplicity.

Medical opinion in his special field seems to concede that Steinach's methods are harmless. If the system fails to respond, at least it suffers no injury. Doctors also seem to agree that the restimulation of the gonads is the best known means of combating arteriosclerosis.

Steinach's methods are likely to upset all calculation of actuaries and economists. If experiments on a large scale verify the conclusions reached by Steinach and his fellow-students, no life insurance policy of the future will be written without making

rejuvenation obligatory. Dr. Peter Schmidt may not be far from right when he suggests that the re-stimulation of the aging Puberty Gland may be made compulsory for the old, as vaccination is compulsory for our children.

Rejuvenation is not confined to the animal kingdom. Even a cabbage may be Steinached. Experiments have shown that cabbages, lasting two seasons ordinarily, may last five, if their reproductive function is checked by radioactivity. A fascinating chapter on the subject remains to be written by a Burbank doing to plants what Steinach does to human beings.

Men and women may not reach the age of Methuselah by traveling one of the roads to rejuvenation, pointed out in the following pages, but at least they need no longer succumb to the encroachments of senility. We need no longer sheepishly accept the ancient formula of old age: "sans teeth, sans eyes, sans taste, sans everything." If the years assail us, we can stand up and fight back.

Instead of second childishness, we achieve second youth. Steinach, following the trail blazed, in France by Brown-Séquard, in Germany by Berthold, vouchsafes, under favorable conditions, not only a second blooming, but a third and a fourth. In fact, the vista of springs recalled in autumn seems unlimited. Why wait till winter comes? Why grow ungracefully old, when one can stay gracefully young?

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INTRODUCTION

THE PROBLEM OF REJUVENATION

EVERLASTING life, perpetual vigor, eternal youth, and if not eternal, a life of vigor and a life of youth: these have been the aims of religion, the alchemist, the chemist, the philosopher, and the physician. They have formed the themes of poets and philosophers for generations. The progress of modern medicine in the last three or four decades, has removed these efforts from the realm of poetry and philosophy to the laboratory of calm scientific investigation.

With the recognition of man's microscopic enemies by modern bacteriology, has come the development of improved methods for overcoming infectious processes, and a better knowledge of hygiene has taught men to prevent the incidence of infections. Metchnikoff and his pupils, as well as numerous other investigators, have pointed out the rôle of low grade infections originating in the storehouse of waste material, the large intestine, or in other parts of the body, in producing the characteristic structural changes of old age.

The removal of extrinsic irritants, bacterial or otherwise, and the teaching of rational living, the outcome of medical progress, has resulted, according

to life insurance statistics, in the prolongation of life by twelve years in the last two decades. With the lengthening of the life span has come a corresponding prolongation of the period of vigor and youth. The mechanism, however, for overcoming extrinsic irritants, as well as for adjustment of physiologic processes, to an environment not always sympathetic or conserving, lies within man himself. Since life is youth and senility slowly progressing death, the secret of youth is within and the dictum of eternal youth is "Man, know thyself."

While the outward signs of senility are apparent, they do not indicate the underlying body changes of old age. The real evidence of old age, premature or otherwise, is the evidence of structural and functional changes in the various organs of the body, especially the vital ones such as the heart, blood vessels and the kidneys.

The maintenance of structural integrity of an organ is determined, among other factors, largely by the degree of nourishment which it receives through its blood supply. This in turn is determined by the width of the blood vessels, which is controlled by the thickness of its walls. As old age progresses, the blood vessels become thickened and the condition of arteriosclerosis or hardening of the arteries results. This thickening may be so extensive as to obliterate the circulation in an organ completely, or it may be only sufficient to limit the amount of blood supplied to the organ. The interference with

the nourishment of an organ causes some of the cells to die thereby diminishing its functional capacity. The thickening of the blood vessels may occur early and senility is then premature. If it does not occur until late, old age is retarded. In other words, a man is as old as his arteries. Numerous other factors, besides the vascular changes, such as repeated infections, continued activity, etc. also tend to produce exhaustive changes in organs.

The maintenance of functional activity of an organ and of the body as a whole, is determined not only by the integrity of its blood vessels but by subtle essential chemical processes which are largely maintained by a series of very important and interesting organs, the ductless glands. These glands consist of groups of highly specialized cells that either pour a specific potent substance into the blood stream or modify it in some other way. The most important of these glands are the thyroid gland, situated in the neck, the pituitary gland, situated at the base of the skull, the adrenal gland, situated above the kidneys, the ovaries and the testes.

There are other glands in the body which manufacture substances which they pour into some other organ through a fine tube or duct. An example of such a gland is the liver and the pancreas and the male sex glands. A number of these glands, in addition to pouring a specific substance through the duct, also produce a specific potent substance which

enters the blood stream and influences other physiological processes by this means.

It is not my purpose to elaborate on the physiology of the ductless glands, which is exceedingly important and highly interesting. We know comparatively little about them, but even that little indicates their tremendous importance and value to the human economy, and this knowledge is yet infinitesimal to the secrets of life that these glands probably hold,

However, I shall briefly indicate a few striking examples of disturbances of these glands commonly met with in medical practice, to indicate their rôle in essential life processes. For example, cretinism and myxoedema are conditions characterized essentially by sluggishness of all life processes. The individual is slow in his movements, stupid, drowsy, the mentality is very dull, and the skin is dry and scaly. If the patient is a child, growth is interfered with. The chief characteristic of this condition is a retardation of all life processes. This condition has been proven to be due to deficiency of the thyroid gland. On the other hand, a disturbance of this gland occurs in which its secretion is probably poured into the blood stream in excess and the individual becomes highly nervous, excitable, loses weight rapidly, there is palpitation of the heart, sleeplessness, and emotional instability. In other words, the process of life is accelerated.

Acromegaly is a condition characterized by a

sudden stimulation of bony growth due to a disturbance of the pituitary gland at the base of the brain. The features become coarse and large. The hands grow unusually large. Such patients suffer from a peculiar headache. A disturbance of this gland may result also in the development of progressive obesity of a certain type associated with marked diminution in the genital function. There is ample evidence, experimental and otherwise, to indicate a close inter-relationship in the function of these ductless glands, both antagonistic and sympathetic. The profound changes in growth, development and function, which results from disease of the ductless glands, produces a singular physiognomy and psychology. Consequently the rather striking resemblance of individuals otherwise apparently normal, to patients suffering with such disease, has engendered the idea that the difference in individuals and races, physical as well as psychical, may have a basis in the ductless glands. There is no doubt that there is more than a germ of truth in this idea, but it still awaits accurate scientific proof. At any rate, there is no more interesting and stimulating study than the study of the ductless glands, and it is the most fruitful branch of medical research. They hold many secrets of vital processes, many of which have not yet been fathomed.

In the realm of practical treatment, the ductless glands have been most fruitful. Most of the specific and potent remedies that have been introduced

into medicine in recent years have been developed from the ductless glands. Adrenalin, a powerful and epoch making remedy, is obtained from the adrenal glands. Thyroid extract, an extract obtained from dried thyroids of sheep and other animals, is a specific remedy for cretinism and myxoedema and the results obtained from it are almost miraculous. Pituitrin, a powerful remedy now so generally used in childbirth,—these have all been the result of research on the ductless glands. Within the last year there has been developed Insulin, an extract obtained from the Islands of Langerhans, the part of the pancreas which produces an internal secretion and which is disturbed in diabetes. While not a cure it has proven a remarkable remedy in the treatment of diabetes, enabling the patient to utilize the sugar and fat of his food when he is otherwise unable to do so. If then we believe in mechanistic medicine at all, and every reputable physician does, it seems that the greatest hope of the future in medical treatment lies in the ductless glands, and that the overcoming of illness may be accomplished by the utilization of man's own powers.

This little volume deals with a phase of the physiology of the ductless glands and presents the results of efforts toward rejuvenation by re-adjusting the physiology of specific ductless glands. We may divide the span of life into four periods,—1), the period of infancy and childhood—2), the period of adolescence—3), the period of maximum

functional activity and vigor—4), the period of senescence.

Each of these periods is characterized by the domination of specific ductless glands. The first period is characterized by a domination of growth and development. The second is the period of sex awakening. The third is the period of maximum vigor, maximum functional capacity and maximum sex activity, while the last period is characterized by a gradual diminution of vigor and all physiological processes.

The importance of the sex glands in the physiology of the individual has been known for a long time. The production of eunuchs artificially is an old practice and indeed a religious rite in certain parts of the world. This has offered an opportunity for observing individuals after artificial removal of the sex organs, the process of castration. The physical characteristics indicating the sex, such as the growth of beard, growth of hair on the body, the distribution of fat, the pitch of the voice etc. are all changed under such circumstances. Besides the physical changes there are changes in the singular psychical reactions and there is a loss of initiative, aggression and energy.

It was Berthold, a quiet German scientist, who in 1849 first studied the problem of the internal secretions of the sex organs experimentally. He found that he could make the wattles and other physical characteristics of the cock disappear by re-

removal of the testes, and that when he did so the fighting instinct also disappeared. He found that this was due to a specific substance secreted by the sex organs and not to any nervous factor by severing the nerves of these organs. These experiments have been further studied and much elaborated by Steinach in Vienna. Steinach showed that by the removal of the characteristic sex organs and the transplantation of the opposite ones, he could change the outward sex characteristics of animals. Steinach further developed the principle that the internal secretion of a gland that has both an outer excretion and an internal secretion, could be intensified when the duct is removed or tied off. Steinach utilized this method of experimentation, not to produce the secondary sex characteristics in animals, but to bring about a profound stimulation of function, with an increase in the physical and psychical vigor which is characteristic of the period of maximum vigor and functional activity. A similar method of experimentation was used in the original development of insulin, a remarkable remedy for diabetes.

Steinach's experiments are indeed convincing, and it is only natural after his experimental success, that the methods should be applied practically. The results of this operation must await the verdict of competent observers and it is some of this experience that is here presented. Final judgment of the method must still be withheld. In the practical application, however, it must be remembered, as I have

previously indicated, that senile changes are due to a diminution of the blood supply as the result of thickening of the blood vessels followed by destructive changes in the organs and by the stress of life itself, as well as to the subtle chemical processes of the body, in which the ductless glands play such an important role. The Steinach operation merely stimulates these subtle chemical processes in the sex glands and other ductless glands if the condition of these glands permits such a reaction. The Steinach operation cannot accelerate the life processes of the body or of any of its organs when profound structural degeneration or thickening of blood vessels is already extensive, nor is it always successful even when such changes are absent.

The work of Steinach represents a great step forward in our efforts to prolong the period of youthful vigor and activity, but it does not solve the problem of rejuvenation. It is merely an indicator of medical progress toward rejuvenation. As Steinach himself has pointed out, we must caution against the promiscuous use of this operation lest the hopelessly senile rush to the mechanistic fountain of youth to find it dry. //

A. S. BLUMGARTEN, M. D.

REJUVENATION

How Steinach Makes People Young

CHAPTER I

THE FOUNTAIN OF YOUTH

HAS Steinach succeeded where Ponce de Leon failed? Is the secret of youth hidden in a ductless gland? Is it possible to fling away the burden of old age? Can we halt the grim shadow that lies athwart our path? Can man play with Death and win? Can he at least defer the check-mate of the eternal antagonist?

No weightier question has ever exercised mankind. What are wars and kings, tariffs and geographical divisions, compared to the most momentous issue of human life? Oedipus faced the Sphinx. All Sons of Adam face Death. Does Professor Eugen Steinach bring us the knowledge the serpent promised Eve, that shall make us like gods?

It is not possible to answer questions such as these with "yes" or "no." I place before the reader the result of Steinach's experiments and researches, as explained by himself and his fellow workers. In doing so it will be necessary to touch upon intimate phases of life. Technical language cannot be altogether avoided. I shall make my statements as simple as possible.

Steinach claims that he can "arrest within modest limits the process of senility." His hopes go further. His experiments with animals seem to prove that it is possible to prolong life itself. Whether or not experience will confirm all his conclusions, his message is the most cheerful that science has sounded in centuries.

The quest for youth is as old as the world. In every age men have sought to wrest from nature the elixir of life. Even to-day so profound a thinker as George Bernard Shaw toys with the idea of extending man's span to three hundred years by exhorting the mysterious forces of Selective Evolution.

The investigations of the alchemists of the Middle Ages are continued by Twentieth Century science. Jacques Loeb, in the Rockefeller Institute, breeds one hundred generations of flies to test the normal duration of life under specific conditions where neither external accident nor insidious microscopic foes can obscure the issue. By subjecting the insects to low degrees of temperature, he multiplies their span of life.

We know that tissue may live indefinitely, that the heart itself may pulsate outside of the body. But bio-chemistry, the chemistry of Life, has not been able to discover an antidote against Death. We can not even retard measurably the process of deterioration within our own body which is responsible for the phenomenon of old age. We grow old by the poisons we ourselves distil.

Even if we succeed in eluding fatal disaster from without and fatal disease from within, we are killed eventually by the toxins in ourselves. The by-products of Life are the agents of Death.

Hence the world was electrified by the news that Professor Eugen Steinach, physiologist of the Biological Experimental Institute of the Academy of Science in Vienna, had discovered the secret, not of life, but of Rejuvenation.

Steinach does not promise to perpetuate life indefinitely, but he provides an antitoxin that checks the progress of old age. What is more, he re-energizes the body.

"We cannot," Professor Steinach remarked to me, "perform the comic opera bouffe of transmuting an old hag into a giddy young damsel. We have discovered no hocus-pocus that will turn a senile ancient tottering to the tomb into a fairy prince. But, under certain conditions, we can stretch the span of man's usefulness, and enable the patient to recapture the raptures, if not the roses of youth.

"Whether the Steinach operation actually prolongs life, we are not, at present, prepared to state, in spite of certain indications pointing in this direction. Scientific workers in many climes must continue to labor before we can venture to draw more definite conclusions. I am a student, not a dreamer. I place my faith solely in the laboratory. I am interested only in those things which I can compel nature to prove to me beyond doubt or cavil."

Professor Steinach is a comparatively young man. He is regarded by many as the world's greatest biologist. His reputation does not rest solely upon the so-called "Steinach operation," but upon many solid contributions to his chosen field. In fact the notoriety which his publication, "Rejuvenation Through the Experimental Revival of the Aging Puberty Gland," brought to his efforts, a notoriety unsought for by him, has made this quiet scholar the center of venomous controversy, and created enemies where formerly he had only admirers.

CHAPTER II

THE MOST ANCIENT CONVENTION

STEINACH is not a fighter. He prefers the laboratory to the arena. He is mild and restrained both in manner and speech. His very beard accentuates the gentleness of his features. He shrinks from publicity. He refuses all interviews.

Professor Steinach talked frankly to me because he felt that I was a seeker after truth who desired knowledge for its own sake, not for its sensational exploitation. He knew that before I came to him, I had discussed the topic with the leading medical men and students of biology in the United States and in Europe. Both in his studies and in his explanations, he is aided by Mrs. Steinach, his most able interpreter.

"I believe," Steinach remarked, "that many of my critics object to the term 'rejuvenation.' If I had called my book 'Reflections on Senescence in Aging Rodents,' there would have been no objection. If I had dealt with the physiological structure of the left wing of the grasshopper, my efforts would have been highly appreciated. But to deal with phenomena of sex and to apply the knowledge gained

from experiments with animals to human beings, seems to be an unforgivable sin.

"However, my offence was even greater. For millions of years all men have grown old and laid them down to die at the right time. To disturb this condition, is to be marked a rebel, against the most ancient of all conventions. Even if I upset cherished notions, is it not better to investigate my conclusions than to quarrel with them?"

"Perhaps," I remarked, "you should console yourself with Heine's observation that since Pythagoras slaughtered one hundred oxen to celebrate his discovery that the square of the hypotenuse equals the sum of the squares of the other two sides of a triangle, every bovine in the world trembles with fear every time a new truth is discovered?"

Many physicians who disagree with the Steinach theory, nevertheless perform his operation. Ponce de Leon came to the coast of Florida to discover the secret of Youth. To-day many who dwell in the New World, reversing his process, seek the Fountain of Youth in Steinach's Old World Laboratory. Steinach made the remarkable discovery that the Fountain of Youth, for which men have scoured five continents in vain, is not without, but within us.

Visitors will find the celebrated biologist ready to explain his theory, but they will note with amazement that his laboratory is bare. Steinach is a scholar before he is a surgeon. While he pursues his studies, others reap the financial harvest by performing his

operation. He himself operates rarely. If he were prepared to devote his time to practice, he would be a wealthy man.

The proof of Steinach's honesty is the paucity of his means. The demoralization of Austrian currency makes it impossible for Professor Steinach to go on with his work. He cannot buy the rats and guinea pigs needed for his experiments. If he could purchase the animals, he could not supply them with food, nor could he pay for the services of an attendant. Thus the great scholar, bearing in his hands the gift of youth and life, is condemned to halt his investigations. No Rockefeller steps forth to endow him.

However, everywhere in the world men are conducting researches based on his findings. "At least," Professor Steinach remarks, "I have the satisfaction that my humble efforts give a new impulse to science. Oculists, surgeons, pathologists, veterinaries, biologists and zoologists, are stimulated in their own field by my investigations. In Denmark, in Spain, in France, in Germany, in England, in Esthonia, in the United States, there are men who verify my conclusions and continue my work."

Benjamin, Chetwood, Hirschfeld, Kammerer, Lichtenstern, Lipschütz, Lydston, Morgan, Sand, Schmidt, are a few of those who must be named in this connection.

The greatest writers of fiction have not permitted the subject to escape them. Several German

novelists have dealt with the problems of rejuvenation. Gertrude Atherton has made it the theme of her novel "Black Oxen."

The ancient fairy tale of the "The Old Wives' Mill" tells us a story that intrigues the imagination. The man who sends his elderly spouse to this magic establishment receives her back a young woman. The lady who visits the supernatural beauty parlor is revamped, that she may "vamp" again.

Professor Steinach provides a Mill for Old Husbands; also, it must be added, a Mill for Old Wives. However, the Mill for Old Husbands works more smoothly than the Mill for Old Wives. Steinach can rejuvenate woman, but the method is simpler in man. The reason for this may be the superiority of the gentler sex, for it is a well known fact that the lower we descend in the scale of animal life, the more easily nature repairs deteriorated tissue. . .

CHAPTER III

THE ENDOCRINE MYSTERY

TO understand the Steinach theory, we must familiarize ourselves with the importance of the endocrine system. We are what our glands make us. Man is as young as his glands. He is, in fact, the slave of his glands. This materialistic creed is summarized in the following epigrammatic lines by an American poet:

*No puppet master pulls the string on high,
Portioning the parts, the tinsel and the paint,
A twisted nerve, some ganglion gone awry,
Predestinates the sinner and the saint.*

*Man, held more firmly than with hempen band,
Slave of his entrails, struts across the scene:
The malnutrition of some obscure gland,
Makes him a Ripper or the Nazarene.*

Modern science teaches us that the growth of our body, the process of metabolism, the shape of our bones, the rate of oxydation, the function of the digestive system, the tone of our nervous system, the action of our brain, are influenced to a large extent by our glands.

These facts are vividly impressed upon us by a visit to the Lenox Hill Hospital which has inaugurated the first endocrine clinic in New York, for patients suffering from disturbances of the glandular system, from migraine to diabetes, under the auspices of Dr. A. S. Blumgarten whose distinguished textbooks on medicine, well-known to the English speaking world, have recently been translated into the tongue of Confucius.

The most mysterious of all are the ductless glands. They are like the strange dark Mothers of Life, unfathomable even to the gods, of whom Goethe speaks in his *Faust*.

The Thyroid gland, for instance, holds a curious relationship to our intelligence. A child, suffering from thyroidal insufficiency, is certain to be sleepy and dull. Where the thyroid is entirely absent, nature produces a peculiar type of idiot. Idiocy of this type can be cured by supplying the system with the extract of the thyroid gland. The moment this extract is withheld, the old condition returns.

The thyroid controls also the rate of growth. Dr. Edward Uhlenhut, of the Rockefeller Institute, arbitrarily breeds monstrously large or preposterously minute salamanders, by increasing or diminishing in various proportions the supply of thyroid and pituitary.

The Pituitary, a lump of tissue no larger than a pea, located in the skull is described by Dr. Louis Berman in his book, "*The Glands Regulating Per-*

sonality," as the "regulator of organic rhythm." The Thymus, the Pancreas, the Pineal, the Adrenals, each of these, has its specific function or functions.

The importance of such glands, as the kidneys, the sweat and the salivary glands, is too well known to be recited here. These glands have "ducts," channels through which their secretions flow. Finally, there are "mixed glands," glands which possess visible ducts and at the same time pour certain secretions into the blood through invisible channels. Such glands are the Pancreas and the Sex Glands, or Gonads.

Possessing canals for conducting reproductive matter to the surface, they are organs of external secretion. But they possess another function, no less important than the creation of reproductive corpuscles, which occupies itself with the internal chemistry of sex.

The ductless gland, located in the "interstices" or "spaces between" the cells of the Reproductive Gland, is called the Puberty Gland by Steinach. It is also frequently designated Interstitial Gland.

The Puberty or Interstitial Gland is Steinach's Fountain of Youth. It was described by two French writers, Bouin and Ancell, in 1903. It was Steinach who first demonstrated its vital importance experimentally. The Interstitial tissue is composed of Interstitial Cells, first seen by Leydig, sometimes called "Leydig Cells" after their discoverer, and of Sertoli cells. These cells produce the internal sex

secretion or gonadal hormone. "Hormone" is the name given to internal secretions. It is derived from the Greek word meaning to "rouse." Hormones are described as "chemical messengers, telegraph boys, sent from one organ to another through the public highway, the blood."

Whereas the Reproductive Gland insures the perpetuity of the Race, the Puberty or Interstitial Gland establishes endocrine and psycho-physical balance. Either directly or through its reaction on other glands, the Puberty Gland determines the masculine or feminine characteristics of an individual, the strength and direction of his sex impulse, and, to a certain extent, the tone of the entire system. The very name bestowed by Steinach upon the gland indicates its function. A decrease in its secretion is believed to be the primary cause of old age.

CHAPTER IV

STEINACH'S DISCOVERY

STEINACH discovered that it is possible to stimulate the Puberty Gland at the expense of the Reproductive Gland. The Gonad, or Sex Gland, we remember, is composed of both. If we paralyze its reproductive function by severing the duct of the gland of external secretion, the Puberty Gland, its organ of internal secretion, tends to "proliferate" and expand.

The cells of the Reproductive Gland, being denied an outlet, shrivel up or "atrophy." Nature abhorring a vacuum, their place is taken by the Puberty Gland. Increasing in size, it pours large amounts of its secretion into the blood with the result of bringing about what is sometimes described as a second blossoming, a new Puberty. The success of the operation depends upon the reaction of the entire endocrine system to the new stimulus.

The duct of the Reproductive Gland is called the vas deferens. Every man has two such ducts, one from each testicle, leading to the external organ of generation.

The removal of a portion of the vas deferens

is called vasectomy. The constriction or strangulation of the vas deferens is called vaso-ligature. A combination of both constitutes the famous Steinach operation. In other words the Steinach operation turns the sex gland from a mixed into a ductless gland, in order to stimulate its internal secretion.

Dr. Banting's cure for Diabetes is based on the same principle as the Steinach operation. The Pancreas, like the Gonad, is a mixed Gland. In order to stimulate the Insulin, its internal secretion, its duct is severed or blocked by the surgeon.

Steinach, to cite one of his chief American exponents, Dr. Harry Benjamin, of New York, gives the patient a more or less massive and continuous dose of his own gonadal hormone instead of the hormone of another human being or of a monkey. The Steinach operation has nothing in common with the transplantation of monkey glands advocated by Voronoff.

The operation does not, as many persons believe, render the male sterile, if performed unilaterally. It merely blocks the passage of the life-giving element, the spermatozoa, from one testicle. The testicle remains unchanged in appearance. Unable to discharge its external secretion, it accelerates the output of its internal secretion, the gonadal hormone.

If the operation is performed on both sides, needless to say, sterility results, because the passage of the life-giving element is entirely blocked. This element forms, however, only a small part of the fluid ejaculated. The secretions of several other

glands, especially the prostate, enter into the composition of the sexual discharge.

The Steinach operation does not interfere with potency or sexual enjoyment. In fact both may be marvelously intensified. It merely interferes with the passage of the spermatozoa. The man who undergoes the Steinach operation bilaterally, while renouncing fatherhood, still retains every attribute of masculinity. No one can tell that he has been Steinached, unless he himself gives away the secret. He may still be a Don Juan. In fact, it has been noted that the Don Juan type, like its feminine counterpart, is frequently sterile.

The man who undergoes the operation on one side only, renounces nothing. His generative power is favorably affected. Such, at least, has been the observation in animals. The stimulation given to the entire system increases the production of both sex hormones and spermatozoa.

Much depends on the skill of the surgeon who, in severing the duct, must be careful not to mutilate the numerous vesicles and nerves, carriers of blood and sensation, which abound in the spermatic cord. An inadequate technique, blunderingly applying the knife, may offset the stimulating effect of the operation. Bilateral vasectomy is the method prescribed in several states for the sterilization of criminals. The operation is not feasible in women, owing to differences in their anatomical structure.

It would be disheartening, indeed, if rejuvenation

were confined to the male, if the Wandering Jew, renewing his youth, could not find a Wandering Jewess; if the Helen of Troy and the Blonde Marguerite of the future were compelled to join that chorus of aged sweethearts

Eves of an hundred years

Upon whose brow God's dreadful finger lies,

depicted by Baudelaire, while their mates, the Paris and the Faust of the Twentieth Century, were having a new fling at life!

CHAPTER V

THREE ROADS TO REJUVENATION

FORTUNATELY, the Steinach operation is not the only road to rejuvenation. There are, Steinach explained to me, two other methods to accomplish the same result, used successfully on both men and women. The first involves the implantation, wholly or in part, of the sex glands of another human being or of an animal.

The implanted organ is placed between the muscle of the abdomen and the peritoneum. After the wound has healed, it is invisible to the eye. The drawback of this method in the case of human beings is the fact that the tissue in question is rarely available.

Sensational stories have gained circulation of millionaires paying fabulous sums for obtaining the glands of a healthy young person. One case has come to my attention where a wealthy German paid one million marks, before the collapse of the mark, to achieve his object.

Gilles de Retz, protector of Jeanne d'Arc and Marshal of France, the original Bluebeard, murdered hundreds of children for the purpose of seal-

ing his pact with the Devil. Wherever the Marshal resided, the children of the neighborhood disappeared. It is by no means inconceivable that some Gilles de Retz of to-day may leave a trail of victims behind him in order to secure his own rejuvenation. . . .

The implantation method has other disadvantages. There is no guarantee that the alien tissue can be successfully ingrafted. It may be absorbed without taking root in the organism. The difficulty is enhanced if we attempt to borrow the glands needed for the operation from another species, even if, Mr. Bryan to the contrary notwithstanding, it is as closely related to us as the ape.

The second method applicable to both sexes, involves the use of the Xray. It is possible, Professor Steinach informed me, to cause the sensitive Reproductive Gland to atrophy under the Xray, while leaving the sturdier Interstitial or Puberty Gland, common to both sexes, intact. Here, as in the case of the Steinach operation, proliferation of the Puberty Gland ensues.

If the reproductive tissue is damaged irreparably, complete sterility results. The operation cannot be repeated. That seems to be the experience of Mrs. Atherton's heroine in "Black Oxen."

Greater medical skill and a more dexterous use of the Xray can attain more favorable results. If, as the experiments of J. Kyrle, of Vienna, on dogs have shown, the Reproductive Gland is not completely

destroyed, the entire Gonad reconstitutes itself eventually. The operation, under such conditions, does not render the patient incapable of parenthood. The treatment may be repeated a second and a third time. In fact, theoretically, there is no reason why the cycle should not be repeated indefinitely.

The Xray method requires complicated machinery, frequent treatment, and a masterly physician who, almost intuitively, regulates the strength of the Xray in accordance with the needs of the patient. In other words, the physician must work in the dark. Nevertheless, remarkable results have been obtained by this method.

To recapitulate:

" The Interstitial or Puberty Gland, which determines in a large degree the youthfulness of an organism, may be stimulated by three methods:

One: Vasectomy combined with vasoligature (the Steinach operation).

Two: The implantation of the Gonad, or sex gland of another being, human or animal.

Three: The application of Xrays.

Paul Kammerer, the noted biologist, who conducted many experiments in common with Steinach, indicates a fourth method: Heat. He recalls the fact that hot climates accelerate puberty, that Southerners are more passionate than those born under colder stars, and that the effect of travel in the tropics on the passions is marked.

Various experiments on animals convince him that

heat stimulates the Interstitial Tissue. Local application of heat by electricity, either alone, or in combination with the Xray, will no doubt, constitute part of the technique of rejuvenation. Clinical material on this phase of the subject is lacking. For the present, the three main methods outlined, must suffice.

The first method is practically limited to men. The second and third methods are applicable to either sex. The fourth method, suggested by Kammerer, is indicated especially in the treatment of women. \

CHAPTER VI

MALES AND FEMALES MADE TO ORDER

“THE idea of rejuvenating the organism by stimulating the Puberty Gland did not,” Steinach remarked, “leap from my brain full-fledged like Pallas Athena from the head of Jove. It developed logically, step by step, from my work.”

Asked to retrace these steps in broad outlines, the great biologist summarized the remarkable experiments which led him inevitably to his conclusion.

The first step was the Permanent Transplantation of Gonads. The animal was emasculated, and the sex gland grafted upon another portion of his anatomy, usually, but not necessarily, in the abdominal region. In the new location, the Reproductive Gland was unable to function. Nevertheless, the animal did not become an eunuch in appearance or action.

This proved that the sexual development both of the organs and of the brain, and their “erotization,” does not depend on the function of the Reproductive Gland, but on the chemicals with which the hormones of the Puberty Gland are charged. Sex, in other words is determined not by the reproductive tissues, but by the gland of internal secretion.

The second step was an arbitrary experiment in Masculinization and Feminization. It was necessary to determine if the Puberty Gland possessed a specific sex, if it made a difference, whether the male or the female principle was at work.

It appears that there is a gland for each sex, each entrusted with its own and specific task. If after castration, a female gland is transplanted upon a male, or reversely, a complete transformation of the original sex character of the animal takes place. It is possible to manufacture males and females to order.

Steinach succeeded in causing lactation in the male guinea pig by implanting a female gland upon its body after emasculation. Females thus made to order actually nursed the young. They are females in every respect, save one.

Similarly, female guinea pigs are converted into males after their own sex glands are eradicated. In some instances, Steinach discovered a tendency on the part of the animal to adopt not merely the characteristic aggressive attitude of the male, but its external sex characteristics. The clitoris approximates the appearance of the male organ of generation.

The third step was Artificial Hermaphrodization. If both a male and female gland are implanted upon an infantile organism or a castrated animal, an experimental hermaphrodite is produced. Both the appearance and direction of the sex instinct of the animal is bi-sexual.

The fourth step was the practical application of the knowledge acquired.

A. Curing results of castration due to accident or disease (i. e. tuberculosis) by the permanent implantation of healthy gonads. The patient is no longer a eunuch, even if science cannot restore the power of procreation.

B. Operative treatment of inborn sex inversion. Where the sex impulse does not coincide with the external characteristics of sex, it is obvious that the Puberty Gland functions inversely. We have the case of a man not with a feminine soul but with a feminine Puberty Gland.

This condition has been remedied in several instances by the implantation of masculine gonads. The operation, to be successful, should be followed, as a rule, by psycho-analysis, in order to correct acquired mental "complexes."

C. Experimental Rejuvenation or Regeneration. In the castrate, the Puberty Gland is absent. In the infantile organism, it is undeveloped. The aging organism reveals retro-development of the gland. These three conditions are largely identical.

Nature develops the Puberty Gland in the infant. Science, in a measure, restores the emasculated individual to manhood. Such being the case, it should be equally possible for science to stimulate the aging Puberty Gland.

Once Steinach reached this conclusion, all that remained was to discover the method. He ascer-

tained that most phenomena of old age both in animals and in human beings are accompanied by the retrogression of the Puberty Gland. He also noted that the stimulation of the Puberty Gland, in a large number of cases, affected the entire endocrine system, restoring the appearance and the instincts of youth. In many animals, it restored likewise the power of procreation.

This is true not only of rodents, but of larger animals, like horses and dogs. Steinach's data include among others, the case of a she-goat, in which, after complete cessation of all sex functions for years, he restored both maternity and lactation.

CHAPTER VII

STEINACH VERIFIES WEININGER

WHAT is more evanescent than youth? Yet, Steinach and with him other biologists of distinction, hold that youth is a measurable quantity. A boy's will may be the wind's will. Nevertheless, the degree of youthfulness existing in his body can be measured by dynamometers and proved conclusively by chemical agents. In demonstrating this theory, Professor Steinach explains not merely the secret of youth, but also the grim secret of death.

Steinach, by spurring the Puberty Gland into action, puts Omar Khayyam to shame.

One thing is certain and the rest is lies

The flower that once has blown forever dies

says the poet. Steinach, however, reveals to us that science recalls vanished blossoms and perished springs.

*The Moving Finger writes, and having writ,
Moves on: nor all your Piety and Wit
Shall lure it back to cancel half a line.*

Yet, Steinach's method undertakes to cancel all the

lines the Moving Finger writes upon the face of man. It restores resiliency to the hardened arteries and to the muscles, invigorates metabolism, improves both the memory and the vision, makes hair sprout again from bald heads, and turns the old man's fancy not always lightly to the thoughts that engaged him in the springtime of life.

It must be repeated that Steinach is a serious scholar, professor at a great university and head of a distinguished institution. His results are no more subversive of accepted standards than wireless telegraphy and radium.

I cannot reiterate with too much emphasis Steinach's own statements to me: "I have discovered no cure-all, nor am I conducting a beauty parlor. Favorable results are not obtained in all cases. Success depends upon a number of circumstances and conditions, all of which are not yet completely understood. In fact, we are only at the threshold of the new science of rejuvenation."

Over ten years ago, Professor Steinach first made the statement that "in mammals, the phenomena of puberty and of sexual development, both psychically and physiologically, are dominated by the action of the hormones secreted by the Interstitial or Puberty Gland." He explained that the hormones in question are "specifically male or female, each producing characteristically characteristic phenomena of its own."

The male Puberty Gland induces masculine man-

ifestations and inhibits feminine manifestations. Reversely the feminine activates femininity and inhibits the masculine element. This is called "the antagonism of the sex hormones." Where the puberty gland is mixed, bi-sexuality results.

If the feminine principle predominates the individual, irrespective of the external attributes of sex, will be predominantly feminine. If the masculine principle prevails, the individual will be predominantly masculine. If differentiation is incomplete, hermaphrodism takes place. Either element predominates according to the activity of the hormones in question.

Professor Steinach verified through his experiments the theories of that eccentric young genius Otto Weininger, who died by his own hand after giving to the world, "Sex and Character," a book that carried his fame like a blaze from land to land. According to Weininger, no human being is wholly male or female. The 100% male or female exists only in the limbo of theory.

Any individual, A or B, is never to be designated merely as a man or a woman, but by a formula showing that it is a composite of male and female characters in different proportions, for instance:

$$\begin{aligned} A &= \begin{matrix} a & M & (\text{ale}) \\ a' & F & (\text{emale}) \end{matrix} \\ B &= \begin{matrix} b & F & (\text{emale}) \\ b' & M & (\text{ale}) \end{matrix} \end{aligned}$$

Each of the factors a , a' , b , b' must be greater than zero and less than unity.

Weininger demonstrated his theory philosophically, but admitted that it was not susceptible of laboratory proof. Steinach's experiments reveal that physiology confirms Otto Weininger's speculative deduction.

If, Professor Steinach asserts, the complete male sex gland is removed, we create a eunuch. If the sex gland is re-implanted with the consequent shrinking of the Reproductive Gland, accompanied by an increase in the secretions of the Puberty Gland, we restore not merely the original masculine character, but induce an increased masculine eroticism or "hyper-masculinization." In the female, under similar conditions, we produce "hyper-feminization."

The difference in the behavior and in the appearance of the castrated and the restored animal, illustrates the influence of the Puberty Gland.

If, Professor Steinach explains, the sex gland or gonad is transplanted incompletely, the sex characters are only incompletely developed. The same occurs if it is improperly ingrafted. If the gonads are subsequently or partially removed, a retro-development takes place. The male loses its male, the female its feminine, qualities. The animal again approximates the neuter.

CHAPTER VIII

THE SECOND BLOOMING

THERE is a mathematical proportion between the mass or activity of the secreting tissue and its effect on the development of the individual. Complete sexual development with adequate secretions of the Puberty Gland is attended invariably by youthful vigor.

Inasmuch as the rising or the falling curve of life is dominated largely by the Puberty Gland, Steinach concluded that it was possible to arrest the process of deterioration by rejuvenating the Puberty Gland once, or more often, in the same individual.

Professor Steinach delayed publication of his theory in any form that was accessible to the lay public for several years, but every tenet of his theory is already contained in a communication deposited in 1912 at the Academy of Sciences in Vienna. He did not wish to publish his finding until his data were more complete. Above all, he did not wish to arouse false hopes.

I have already pointed out the three methods by which Steinach induces a second blooming of the Puberty Gland. The simplest of these, the Steinach

operation so-called, has been performed many times in the last few years in Central Europe by Lichtenstein, Schmidt, etc., in Denmark by Sand; in Japan by Sakaki; in Chili by Wilhelm; in the U. S. A. notably by Benjamin, Wolbarst, and Chetwood, in New York, by Vecki in San Francisco and Lespinasse in Chicago.

Present indications show that the effect of the unilateral operation lasts at least five years under normal conditions. After five years, a second renascence may be induced by repeating the operation. Hitherto it was restricted to two successive operations on the same individual.

Professor Steinach, however, has discovered a new method by which the operation may be repeated several times. After that another period of rejuvenation may be induced by implantation, if the other organs of the body are sufficiently sound to undergo the strain.

The operation itself takes only a few minutes, and requires hardly more than three days in the hospital. The most favorable time for the Steinach operation is the beginning of arteriosclerosis.¹ If President Harding had undergone the Steinach operation in time, he would probably not have succumbed to apoplexy. Steinach, in all likelihood, could have saved Roosevelt from death, Wilson from the stroke of paralysis that put an end to his political career.

There are, of course, many conditions and circumstances that may make the operation inadvisable.

Again it may be advisable at a much earlier date. I myself, was present at an operation performed on a young man of twenty-seven and I obtained valuable data from another young man who had been successfully Steinached at the age of thirty-four.

The rat (*mus decumanus*) is the animal selected by Steinach for his experimental purposes. The cages, he explains, were so arranged that the animals were under constant supervision. No expression of temperament, no variation in behavior, escaped his watchful eye.

Professor Steinach felt a personal attachment for some of the animals. He gave them names, and I hear from others that he actually shed tears when lack of food compelled him to kill them.

The young male rat is exceedingly aggressive and responds with phenomenal alacrity to the female of his species. The senile rat manifests a mild interest only and before long feminine attractions cease to exist for him altogether. Even food no longer allures him.

His combativeness vanishes. His hair falls out in spots. His teeth lengthen. He loses weight. His eyesight is impaired. In fact, he frequently suffers from cataract. His muscles and intestines are dry, his body shrivels. Even inquisitiveness, the last vice of old age, deserts him.

The average age of the rat, Professor Steinach declares, is from twenty-eight to thirty months. Between the ages of twenty-one to twenty-seven

months, he is ready for Steinach. His loss of weight and other symptoms of old age are carefully chronicled. It is noted that he ceases to take an interest in his personal appearance. Dirty, unlicked, indifferent, he awaits Death with half closed eyes.

His appetites are tested. A piece of bacon is placed in his cage at a point where he must climb or leap in order to appease his hunger. After a futile attempt, he reconciles himself to starvation.

A female rodent, in all the glory of young rat-hood, is introduced. He sniffs at her, and shuffles away.

A young buck enters, bristling with aggressiveness. The old rat pays no attention to him. If attacked, he is too proud to fight. He is indeed a "goner."

Here, however, Providence in the shape of Dr. Steinach intervenes. The aged rat, it seems, may be down, but he is not out. Steinach performs his operation and, if no complications ensue, the rat, like Jess Willard, comes back.

CHAPTER IX

REJUVENATING THE RAT

STEINACH reports the case of Scheck, an unfortunate senile rat, Steinached bi-laterally, February 4th, at the age of twenty-three months, equivalent to sixty years of a human being. The age is counted in months. I omit technical clinical details.

On the 22nd of February, a number of important physiological changes are noted, including a new growth of hair, an increase in weight of 40 grams, revived interest in food and female rats, playfulness, in short renewed zest for life.

Three days later, our senescent rat, no longer senile, chooses a new soul mate, after polishing his fur to make himself more attractive.

On the first of March, Scheck engages in duel with a young buck rat. On the third, he adds a number of affinities to his harem. On the 6th, his weight is 60 grams more than before the fateful incision. He appears to be extraordinarily voracious. His conduct is increasingly scandalous on the seventh and eighth.

By the thirteenth his fur is clean and glossy, with

snow white specks. On the twentieth he is subjected to a new operation in order to enable the Professor to examine his insides. The anatomical picture coincides with his behavior.

A week later the wound is healed. On the tenth of May, he makes the impression of a young rat. He goes after the bacon. He aggressively attacks his rivals, attempts to throw over his cage and may be described as the Neighborhood Terror.

On the first of July, his conduct is unchanged. On the 14th of September his breathing apparatus seems to be awry. On the 24th he dies.

The autopsy reveals suppuration of the lungs. His glandular system, however, is in perfect condition. The operation has given him seven months of renewed youthfulness organically and functionally. He lived eight months after the operation, dying at the age of thirty-one, one to three months after his allotted time, corresponding to a ripe old age in a human being.

The second patient, Albino, was less fortunate. His interest in the fairer sex did not progress beyond mild flirtations. Foreseeing his fate, he eschewed matrimony. His fur was restored, his muscular system improved, but a few months later, he was found dead in his cage. The post mortem disclosed that Albino suffered from tapeworms.

The next test was made with three brothers at the age of twenty-seven. In October all three had ceased to be either Romeos or romantic. Their throats and

necks were devoid of hair. They showed every manifestation of extreme senility. No operation was performed on the first of the brothers who died only one month later from senile degeneration.

In the case of Brother Rat No. 2, the operation is successful, but the patient dies two months later under the knife to be perpetuated as an anatomical preparation. In the preceding two months, he put on fat, improved in appearance, both externally and internally, and developed the proclivities of a Don Juan.

This is also true of Brother Rat No. 3: only more so. At the age of thirty-six, No. 3 developed lung trouble, and was expedited into a better world. He lived ten months longer than any exemplar of the same brood, eight months beyond the average age. For among rats, thirty months is equivalent to the biblical age in man.

Here, as Professor Steinach pointed out to me, we have an instance where the operation not merely completely rejuvenated the patient, but added twenty-five per cent to the duration of his life.

Weiss, another remarkable rodent, suffered from premature senility. The operation was performed unilaterally. Fifteen days later he was a candidate for matrimony. One month, eleven days after the operation, he is the proud father of a sextet of stalwart young rats. He dies, however, two and one half months after the operation from 'intestinal trouble.

In the cases so far summarized Professor Steinach relies mainly upon the physiological reserve of the animal itself. This method he calls "autoplastic." When, however, the resources of the individual are exhausted, it may be necessary or desirable to ingraft upon him the organs of a youthful animal of the same species. This method Professor Steinach designates as "the homoplastic remedy against old age."

It is possible to use both methods successively. The result in either case is the same.

We are thus able, at least in theory, to multiply the period of youthful vigor almost indefinitely, if the brain and the heart and other organs affected are able to withstand the strain. Lydston, Kreuzer, Muehsam, Lichtenstern, Voronoff and others have applied the homoplastic method in the case of human beings successfully.

The aged female rat shows the same lethargy, the same loss of hair and personal cleanliness as the male. If placed in a cage with a male, the latter contemptuously disregards her. Evidently the male rat prefers the *débutante*.

Jointly with Dr. Holzknecht, Steinach stimulated the Puberty Gland of the female rat by discreet applications of the Xray. The result was startling. The homoplastic method, the implantation of the gonads of young female rats upon elderly females, induced equally remarkable changes.

The first female tested was the mate of Weiss, a male rat successfully Steinached. At the age of

twenty-six, the complete gonads of a four months old female were implanted according to Steinach's method.

Twelve days later it is apparent that the male population of ratdom takes a renewed interest in Mrs. Weiss. This increases from day to day. She, like Mrs. Atherton's heroine, remains coy at first. Nevertheless, as her fur waxes rich and glossy, her amorous propensity is aroused.

She is inquisitive, mobile, flirtatious. Forty-three days after the operation, Professor Steinach assigns a permanent mate to her. She is now, if we ascribe the corresponding human age to her, a woman of sixty-eight.

Three months after the operation she whispers a tender secret into the ears of her mate. She starts building a nest. One week later she presents him with a quintet.

She insists upon nursing her sound and vigorous brood. She retains her youthful appearance, until her death at the age of thirty-six and one half, corresponding to a human being of eighty-four.

Several other cases reported are equally successful.

CHAPTER X

STEINACH STATES HIS CONCLUSIONS

THE results of the Steinach operation seems to be negative, only in cases where the process of senile decay is too far advanced, or where infection or illness intervenes immediately after the operation.

Under favorable conditions, old age is retarded, virility restored, and the normal period of life appreciably prolonged. Professor Steinach's conclusions, based upon a large number of experiments, may be summarized briefly as follows:

1. Vasoligature stimulates the Puberty Gland. Within a few weeks after the operation, the renewed Puberty Gland produces a second puberty followed by second manhood.

2. In the same period the gland of external secretion atrophies, proving the superior importance of the gland of internal secretion, the Puberty Gland.

3. The renewed Puberty Gland acts in the same way as the transplanted gland. In either case, the system is "eroticized," a condition of hyper-masculinization is frequently noted.

4. There is a noticeable increase in the growth

of hair, muscular power, the rebuilding of tissue, etc.

5. Food is utilized by the organism again for the purpose of reconstruction and growth. Metabolism measurably increases. Fatigue and dullness are no longer in evidence. The sex instinct is accentuated.

6. The changes that occur are too many to be caused solely by the action of the Puberty Gland. Many effects can only be explained by the reaction of the sex hormones upon other glands.

The glands, as an American student of endocrinology, Dr. Louis Berman aptly remarks, form "an interlocking directorate" for the control of the organism. Several biological students have noted changes in the microscopic structure of the pituitary and other glands of animals subjected to the Steinach operation.

7. The primary effect of the operation is the increase of the Puberty Gland and the atrophy of the Reproductive Gland. This is followed by a restitution of other organs and functions. This restitution extends in the end to the Reproductive Gland.

8. Experiments on senile animals prove that the life time of tissue as such is not limited. If the senile tissues receive new stimuli from the organs of internal secretion, they are susceptible of regeneration and renewed growth. Blood is propelled through them with renewed vigor.

9. A unilateral vasoligature is usually sufficient to stimulate the Puberty Gland. In such cases, the senile animal is thus enabled to produce healthy offspring. The method has been successfully applied in the case of high bred hunting dogs and studs. In fact, Professor Steinach was recently permitted by the Prussian state authorities to perform his operation on a famous steed in the former imperial stables at Herbeshausen.

10. The question whether the Steinach operation prolongs life is still open. It does in animals. Dr. Benjamin conjectures that the effects of the operation may be more intense in inferior races, just as it is even more noticeable in animals than in human beings.

For the present, Professor Steinach is satisfied to state that "rejuvenation or the delay of senescence is possible" that "the senile individual is reanimated functionally and organically," that "this new period of rejuvenescence and vigor may continue for a considerable time," and that "the final age reached may surpass by far the normal average of life."

CHAPTER XI

STEINACH'S FIRST HUMAN EXPERIMENTS

HAVING demonstrated his theory scientifically, Steinach does not hesitate to apply his methods to human beings. In conjunction with his colleague, Dr. Lichtenstern, he reports a number of remarkable cases. In the instances cited by him, auto-suggestion was excluded. The patients did not know that they were Steinached.

The first case, A. W. suffered from precocious senility at forty-four. He was emaciated, listless, weak, constantly fatigued. Two or three months after the operation he puts on weight, his skin regains its old suppleness. After four or five months he is able to lift heavy weights, his hair comes back. In fact, he is compelled to shave more frequently than of old.

In spite of miserable food conditions, he continues to gain weight. Eighteen months after the operation he is indeed a "new man." His face is without wrinkles. He makes the impression of a strong youthful individual in full possession of all his functions.

The second patient, E. T., aged seventy-one, was the manager of an important industrial concern. He suffered from dizziness, trembling of the extremities, a weak heart, difficulties of breathing and pronounced arteriosclerosis.

Nine months after the operation unilaterally performed, he writes that his appetite is "immense," his physical depression has "vanished." He has regained the "elasticity of youth and the appearance of a man in the early sixties." He can take long walks, his arteriosclerosis seems to be checked, his hand no longer trembles, he needs a hair cut once a week, and considers matrimony.

Mr. J. S., sixty-six, a merchant of considerable importance, suffers from loss of memory and marked diminution of his intellectual capacity. He is tired, weak, depressed, wrinkled and suffers from a variety of ailments, which, while important clinically, need not detain us here.

A prostatic operation brings no relief. Two months later the patient is Steinached. Immediately his appetite increases. He gains over four pounds a week. His mental resiliency returns.

The typical manifestations of old age (dizziness, difficulties of breathing when engaged in muscular exertions, pains in the limbs) disappear. Typical manifestations of youthful vigor are noted. His face blooms, his wrinkles vanish. This mental and physical reconstruction continues after he leaves the repair shop.

REJUVENATED



BEFORE THE OPERATION

Note general debility, wrinkles, hollow neck and chest. One of Steinach's cases.



AFTER THE OPERATION

Note how the neck has filled out and the expression of the eyes changed. General appearance indicates considerable improvement.

"Professor," I remarked, "you said to me that you were interested only in facts capable of demonstration. Are the changes you state verifiable? Is it possible to ascertain with scientific precision the degree of youthfulness attained after the Steinach operation? Are not many of the phenomena purely subjective, colored to a certain extent by the unconscious bias of the patient or the physician?"

"Fortunately," Professor Steinach rejoined, "my statements are susceptible of scientific proof. Youth is a measurable quantity. The degree of youthfulness can be tested. A man is not as old as he feels, or a woman as old as she looks. Neither can age be stated precisely in terms of time. If we wish to form a clear conception of the age of any organism, we must conduct an investigation with mechanical devices and with the test tube. The microscope, too, is an invaluable ally.

"The age of an organism may be determined physiologically by the proportion existing between cells functioning actively and indifferent cell tissue in various organs. In young individuals the functional cells predominate in fairly constant proportions.

"After the operation we discover a distinct increase in the number and in the activity of the functional cells. Blood pressure, too, is an almost infallible indication. We invariably discover a decided decrease in blood pressure after the Steinach operation. Blood pressure, too, is a factor that varies with age,

though, of course, it is also dependent upon other conditions.

"Muscular power can be measured. The dynamometer establishes the normal muscular power of the average age and the average person. The dynamometer clearly reveals the increase in the patient's muscular power after the operation, and indicates the degree of youthfulness attained. Muscular changes are often observed in the structure of the eye. In many cases near-sightedness, depending upon muscular degeneration, disappears after the operation.

"We also know the rate of absorption of oxygen characteristic of various ages. The amount is much larger in a young and vigorous person than in a person of advanced years. Complicated machinery for determining oxydation exists. Oxydation determines the rate at which metabolism proceeds in the body.

"Exact measurements before and after the operation show the physiological age of the patient. If a man of sixty shows after the operation that his oxygen consumption equals that of a person between thirty and forty, we know that we have lifted at least twenty years from his age. Rejuvenation is no longer a figure of speech.

"Finally, chemistry makes it possible for us to subject the age of living matter to a precise test that can be stated in definite mathematical formulae. My friend Professor Vladimir Ruzicka, head of the Institute for General Biology and Experimental Mor-

phology at the University of Prague, employs protoplasma hysteresis."

"Professor," I interrupted, "I have followed you through a maze of scientific terminology, but protoplasma hysteresis is a little too much for me."

Steinach seemed somewhat surprised that so simple a term should embarrass a visitor. The Ruzicka hypothesis, accepted by Steinach, is so interesting that it deserves separate consideration. It explains why we grow old. It also explains the secret of death.

CHAPTER XII

THE SECRET OF DEATH

THE substance of any living organism, Professor Steinach explained, undergoes from its earliest beginnings to the end a continuous process of progressive condensation. This progressive condensation, or protoplasma hysteresis, is one of the causes of old age. It mechanically arrests metabolism and thereby produces senile atrophy. Finally, through the complete cessation of metabolism, protoplasma hysteresis is the cause of "natural" death.

Protoplasma hysteresis seems to hold the key both to Age and Death. It also determines the degree of youth or rejuvenation. When we say that age creeps upon us, we merely mean that the channels of circulation, and the pipelines through which waste is eliminated, are slowly clogged up by the physiological by-products.

The degree of condensation can be measured in several ways. We can determine the concentration of hydrogen in the organism or the amount of alcohol required to dissolve it in certain solutions.

Dr. F. Hajek, a colleague of Ruzicka, has de-

terminated the index number characteristic of various degrees of age. We can now test the effect of any physiological process upon the age of an organism by measuring the change in the condensation of tissue.

There are many processes which increase or diminish the degree of condensation. For instance, inflammation first diminishes the density of the affected tissue, but afterwards, when scars begin to form, the condensation increases.

Since protoplasma hysteresis is a progressive process, beginning with the egg and reaching its complete equilibrium in death, it is clear that when the degree of condensation existing in any organ falls below the index characteristic of its age, we can speak of its rejuvenation.

Professor Ruzicka took three pair of Steinach's white rats. One of each couple had been operated under Steinach's supervision. Ruzicka found that the liver, the heart, the muscle, kidneys, lungs and gonads, etc., of the animals that had been Steinached, revealed a degree of condensation far below the normal index. In the rats that had not been Steinached the process of protoplasma hysteresis proceeded unchecked. They were physiologically "older" than their companions.

"There is no question in my mind Professor Steinach remarked, "that Ruzicka has discovered a which, as our knowledge increases, will enable us to state with finality the physiological age of any organ-

ism. The physician of the future should be able to determine precisely how many years an attack of influenza took from a person's life and how many years were added by a successful stimulation of his internal secretions.

"I have opened one door to the palace of truth. Ruzicka has opened another. No doubt there are hundreds of gates I have overlooked, a hundred corridors that others, luckier than I, will discover. The greater part of my task is still before me. One life time is hardly sufficient to proceed more than a few halting steps toward the supreme sanctuary where, shrouded by seven veils, broods the image of Truth."

CHAPTER XIII

ECONOMIC ASPECTS OF REJUVENATION

MOST people look upon the Steinach operation chiefly from the point of view of the individual. The revival of the sex centers especially engrosses their imagination. They forget that the sex revival, which does not invariably occur, is only incidental to the general rejuvenation of the system.

Critics of Steinach deliberately ignore the fact that a successful stimulation of the Puberty Gland by Steinach's methods adds several years, possibly decades, to the economic life of the patient. From the point of view of national economy, the importance of Steinach's discovery is prodigious. We can easily calculate how much one hour added to the working day of every human being increases the national wealth. How much more is the nation likely to profit, if five years or more are added to the active life of men and women at the height of their maturity and experience!

The Steinach operation is likely to affect all calculations based on our present statistics of health and longevity. Recently at a meeting of under-

writers in New York, the effect of Steinach's discovery on life insurance, disability clauses, etc., was discussed with much animation. Provisions for old age, pensions, etc., will be subjected to substantial modifications, if the Steinach operation becomes universal. In fact, some persons with speculative proclivities already foresee an economic war between the young generation and their elders who refuse to grow old.

Stinnes declares that Germany can pay no reparations unless labor consents to surrender the eight hour day. The Steinach operation, according to Dr. Peter Schmidt, Steinach's foremost pupil in Berlin, eliminates this necessity, because it adds five to ten years to the life of the individual and the nation. "If," he avers, "every German devotes five to ten years of his life to the reconstruction of Germany and the payment of legitimate reparations, the problem can be solved without undue hardship."

Schmidt is a brilliant young surgeon who probably holds the record for Steinaching the largest number of people. When I recently discussed the subject with him at a clinic in Berlin, he had performed one hundred operations. In the meantime, he has probably more than doubled this number. Schmidt not merely performs the operation, he also espouses the Steinach theory in his writings.

"I am convinced," he remarked to me, "that the time is coming when the state will expect every citizen to be Steinached at least once. I can readily

conceive that the Steinach Operation may be made obligatory, like vaccination. Before the citizen of the future will be permitted to retire, the state may ask him to produce a Steinach certificate, just as the state to-day insists upon a vaccination certificate before admitting a child to school.

"Most people grow old and die before their physiological time, because the avenues of life within the body, the channels that carry nourishment or eliminate waste, are prematurely clogged. It is not the brain that grows old. It is not the ganglions that break down. It is the hormones, the internal secretions, that go on strike.

"When they cease to function, to carry their messages from organ to organ to stimulate activity, to purify and renew the high roads of the system, the deadly concentration of living matter brings life to a stand still. This is what happens in arteriosclerosis. Arteriosclerosis is the ailment of our time.

"I have performed over one hundred Steinach operations. I admit that I know considerably less now than after the first. However, I have definitely reached three conclusions:

One: The Steinach Operation checks high blood pressure.

Two: It retards Arteriosclerosis.

Three: It is harmless."

In other words, the worst that can happen after the Steinach Operation is—nothing. The revival

of the Puberty Gland by any of the three methods advocated by Steinach puts the hormones again to work. It sweeps the high roads of the body. It clears away the muck, the accretion of years, unless the processes of deterioration have advanced beyond repair.

"When" Schmidt says, "the heart is irreparably damaged, when kidneys cease to work, when the gonadal system has shriveled completely, neither vasoligature nor the implantation of glands will be of avail."

The secret of Steinach is his use of nature's own powers of recuperation. He is not a miracle man. He performs no wonders, but scientific experiments, based on careful reasoning and exact observation. If we stop the condensation of arteries and other channels of life before it is too late, the brain receives new nourishment. The entire system is reactivated. Death is postponed. ¹¹

The only real death is brain death. Eventually the brain, too, tires and dies, but it is far more durable than we suspect. There is no reason why so many men should be snatched away from life, or condemned economically to innocuous desuetude before their appointed time.

CHAPTER XIV

WHEN TO BE STEINACHED

THE age to be Steinached depends on the condition of the patient. Incipient arteriosclerosis is usually an indication that the endocrine system is no longer equal to the task of maintaining the resiliency of the organism so essential to its well-being. In women the treatment is most effective at the time of the menopause. Men are more fortunate in that surprising results have been attained even at the biblical three score and ten.

The lives we lead are so complicated, the conditions under which the majority is compelled to live so unnatural, that in most cases, arteriosclerosis and other phenomena of old age appear between forty and sixty. This is the period when most persons should be Steinached for the first time.

The process can be repeated several times, after five or ten years, when the effect of the first treatment wears off. In this manner, vitality may be preserved until an advanced old age. Then, if Kammerer is right, death comes, pleasantly almost as in a dream. The patient dozes away without pain or struggle. It remains to be seen, if this hypothesis is borne out by facts. It has been demon-

strated beyond doubt only in animals. The science of rejuvenation applied to human beings is still too young to afford sufficient material for final conclusions.

The Steinach operation not merely retards old age, it favorably affects diseases associated with the climacteric period in men and women, especially disorders involving derangements of the endocrine system including diabetes, gout, cancer, metabolic disturbances of every description, impotence and nervous diseases. It has been known to cure certain forms of insanity.

"The first cases reported by Steinach," Schmidt explained to me, "are now over six years old. So far experience confirms his thesis. However, we can go back far beyond this period. Operations of a similar nature were performed in the United States long before Steinach. Phenomenal cases of rejuvenation were reported by American doctors who had no idea of the effect of vasoligature and vasectomy on the aging Puberty Gland.*

"Recent investigations have shown that several patients upon whom vasoligature and vasectomy was performed at an advanced age in connection with other surgical operations still enjoyed an astonishing measure of youthfulness ten years later."

"The phenomena described by Steinach have been observed so universally that there is no reason for

* A confirmation of this statement will be found in Dr. Chetwood's report, discussed in a subsequent chapter.

concealing these facts, so important both therapeutically and economically, from the public at large.

"We must not expect blonde locks growing in plentiful profusion on bald pates, nor expect to dwell on earth in eternal youth. We can merely assert that medical science has succeeded in a large number of cases in arresting premature senescence and restoring a measure of youthful vigor.

"It is not surprising that Steinach's announcement lead to exaggerated hope on the one side, and pronounced skepticism on the other. We have striven with the aid of mechanical contrivances, chemistry, and photography to demonstrate the truth of our contention.

"Photographs as such, cannot adequately depict the change in facial expression, the disappearance of wrinkles, etc., the completely altered aspect of a revived personality. Here the moving pictures come to our aid."

Schmidt explained to me the genesis of the much-discussed Steinach film. Steinach was opposed to the exploitation of his discovery in moving pictures. However, he yielded to the personal solicitation of the President of the Austrian Republic. President Hainisch believes that little Austria justifies her existence by bestowing so great a boon on humanity.

The moving picture machinery of the state, inherited from the war, was placed at Steinach's disposal to enable him to transmit his message. It shortly appeared that the facilities of the Austrian

Government plant were too limited for the enormous preparations required. The greatest German moving picture concern, the Ufa, took the matter in hand. The film was created under scientific auspices. Several pictures from the film are reproduced in these pages.

Steinach was persuaded that modern science has no right to despise the immense educational agency of the film. Other scientific discoveries of less vital importance, like Einstein's theory of space, are being popularized by the movies.

The Steinach film presents the method and theory or rejuvenation in five great movements, called "problems" in the film. It familiarizes us with Steinach's experiments. It is also an eloquent appeal for sexual education and reform. It was produced under the personal supervision of Steinach, with the aid of a distinguished corps of medical experts.

Steinach was attacked by many members of his profession for lending his name to the film. "These men," Schmidt remarked, "seem to think that the truth is desecrated if it leaves the study of the scholar to appear in the limelight of popular discussion. To my mind, truth, like religion, should be carried to the people. It should not be jealously hoarded by the profession.

"The question of rejuvenation, its possibilities, and the time when it should be attempted, affecting as it does every human being, is too important not to invite the frankest public discussion."

CHAPTER XV

DR. SCHMIDT'S ONE HUNDRED CASES

DR. SCHMIDT explained to me how he reached his deductions from the wealth of material at his disposal and from the critical perusal of the Steinach literature growing in every civilized country.

"In my book, 'Theory and Practice of the Steinach Operation,' I carefully correlate my own experiences and the material submitted by others. The first result of the operation in most cases, is a decided increase in appetite, to the point of voracity, an improvement in metabolism, and a pronounced increase in weight.

"In many cases of men suffering from premature hardening of the arteries, we have observed an increase of 12 kilograms. Younger people also showed a remarkable and constant tendency to take on weight.

"Cheeks filled out, wrinkles vanished. I know several cases of men of fifty whose ruddy complexion makes it hard to believe that they have reached even the forties.

"I operated on two patients, both men of fifty, whose heads, completely white at the time, revealed

a new crop of hair, considerably darker than the original color, several months after the operation."

This statement was verified in every detail by Dr. Harry Benjamin, of New York, who carefully investigated the record of Dr. Schmidt's patients. Dr. Benjamin embodied his report in papers read before the Eugenics Research Association on the "Effects of Vasectomy," and in his "Preliminary Communication Regarding Steinach's Method of Rejuvenation" contributed to the New York Medical Journal. My own personal observations likewise corroborate, from a layman's point of view, Dr. Schmidt's striking assertions.

"In July of 1921," Dr. Schmidt continued, "I Steinached a sixty-four year old farmer, who came to me on crutches, a victim of premature senility. He was tormented by gout and was so weak that he could hardly support himself outside of his bed. I undertook the operation without the slightest hope of success.

"Who can describe my surprise when this man came to my office in 1922 without leaning on a cane, apparently completely restored. He had gained 9 kilograms, and was able to carry a hundred pound weight. He has even recovered his pleasure in tobacco.

"I cannot quite explain why vision is improved by the operation. Nevertheless, the improvement, in in many cases, is unmistakable. I remember the case of a carpenter, aged forty-seven, who came to me in

1920. A few months after the operation his sight had increased to such an extent that he was able to see the bricks on the roof of a house opposite my office. Previously all he had seen was a mass of red. He is now able to get along without glasses."

No less marked is the restoration of intellectual powers reported by Schmidt. Several retired business men were forced by the depreciation of German currency to go back into business. The Steinach operation restored their mental agility.

Recently, an American merchant came to Berlin in order to consolidate a number of important corporations. Though only forty-eight, he found that he had lost his initiative and his elasticity. He was unable to cope with younger men. Six months after the operation he wrote to Schmidt:

"I am satisfied in every respect. In fact, I feel as if I was newly born. My poor memory and general apathy no longer exists. I have regained my 'pep.' My power of endurance is admired by men of fifteen to twenty years my junior."

Subsequently, I met the patient in question who, of his own accord, confirmed Dr. Schmidt's observations.

I was privileged to be present at an operation performed by Dr. Schmidt. In this case, the reason for the operation was extraordinary. The patient was a man of twenty-seven years, a commercial traveler,

who suffered from what is known as an "inferiority complex." He was possessed by the illusion that everybody was prejudiced against him. This was a great handicap to him in his work. It made his life miserable.

The operation was performed on one side only. Schmidt's object was to strengthen the entire masculine chain of glands, energize the patient and to increase his self-respect. Only local anesthesia was used. The operation was over before the patient knew it. It hardly took ten minutes. It was almost bloodless and entirely painless. The Steinach operation does not confine a patient to bed for more than three days.

It is too early to tell, if Schmidt accomplished his purpose. In cases such as these, involving psychic disturbances, both Schmidt and Steinach recommend psycho-analytic treatment, after the operation. The surgeon sends new energy to the brain cells. The analyst disentangles faulty mental associations. Psycho-analysis alone was unable to help the patient. He had been sent to Schmidt by the psychiatrist of the Sex Science Institute in Berlin.

I had the opportunity to interview three other men who had been successfully "Steinached." I had read Dr. Schmidt's report on their cases. It was not difficult to identify them from their own descriptions. They stepped so to speak out of the pages of his book. Their living testimony was even more convincing than the printed report.

By a weird coincidence, the three called on me at the same time in Berlin where they sipped my cognac with relish as they related their experiences.

The first was a technician of about thirty-seven who suffered from premature debility. He had tried every known treatment, hydrotherapy, hypnotism, electricity, without success. After twelve years of futile attempts, he had resigned himself to his fate. He came to Schmidt to be Steinached.

Three weeks after the Steinach operation, he sent his doctor a wedding announcement and he has lived happily ever after. His head, completely bald at the time of the operation, is now, three years later, completely covered with fine hair.

The second was a porter, Steinached at the age of fifty-four. His feet were swollen. His heart was heavy. "My blood pressure," he assured me, "was over 250. It was so high that it could not be recorded by the instrument. It is now 180. I was always tired, a burden to myself and to others.

"I am never tired now. Formerly, I went to the barber once a month. Now I require a hair cut every week. My hands and feet no longer tremble. I am able to pursue my occupation." Since he is a porter by profession, his burdens, literally speaking, are many.

The third patient interviewed by me was a factory hand. He, too, was fifty-four at the time of the operation. He looked somewhat undernourished. "You see," he remarked apologetically, "we haven't

much to eat. I see meat only once a month. Nevertheless, I am strong. Before the operation, I was as weak as a fly. If I had not been operated, I would not be alive. I was 'down and out.'

"I was too weak to accept a job where my only duty was to sit up at night and press a button, whenever a tenant entered the house. I had to support my wife and her blind sister. Both faced starvation. I assure you it was no fun. Now I can work as hard as ever. I gained twenty-five pounds after the operation. I feel as young as a boy."

"How was the operation?" I asked. "Only a local anaesthetic was used. The doctor told me I could smoke during the operation. I did."

In the face of such testimony, it is difficult not to believe.

CHAPTER XVI

U N E X P E C T E D C O R R O B O R A T I O N

I DID not confine my personal investigations to Schmidt's patients. I crossed-examined a patient operated under the personal supervision of Steinach in Vienna. I obtained additional evidence from several patients Steinached by American surgeons.

Critics may say that I was captivated by a theory, that the patients interviewed were under the influence of a powerful auto-suggestion. I shall presently cite, in support of my contention, certain incontrovertible cases reported by an American surgeon, Dr. Charles H. Chetwood, who, unknown to himself, Steinached several patients before Steinach enunciated his theory of rejuvenation.

Subsequently Chetwood made a pilgrimage to Vienna. Writing in the *New York State Journal of Medicine*, he transcribes his impressions of Steinach's personality and his work. He also gives to the world the corroborative evidence of his own experience.

Steinach, in Chetwood's opinion, is the Burbank of humanity. "I found," he says, in "Professor

Steinach, a man of gentle nature and simplicity of character whose great scientific attainments are acknowledged in Vienna even by those who have not endorsed his opinions.

"The study of transplantation, animal and human, embraces an extensive field, much of which is yet to be traversed. The success attained in agriculture and horticulture, is not devoid of meaning to this allied branch of biological science in the probable revelations of the future."

"My interest," Dr. Chetwood continues, "was first aroused upon the publication of Steinach's investigations on the subject of rejuvenation by the announcement that the operation of vasoligature was performed for this purpose. And more especially because for many years I had been an exponent of this identical technique as a surgical expedient for certain other indications.

"I found a thesis on this procedure, written by me some twenty years ago; other articles followed, and the method is referred to in the first, second and third editions of my text book. At no time, however, had there been in my mind any thought of the possibility of rejuvenation, or any knowledge of histological changes in the testicles that occurred as a result of this operation.

"Before investigating the subject as thoroughly as has since been my endeavor, it occurred to me that it might be of interest and proper to search the case records, and look up the patients who had been sub-

mitted to operation at my hands. This has been accomplished as far as possible. Some of the patients cannot be traced; some were at an age that cannot be included consistently in a discussion of senium praecox.

"There is, however, a sufficient number of cases to elicit attention, and to serve as a contribution to the present discussion. From these I have selected four cases, because of the absence from their histories of features that would to an extent obscure the situation; that is to say, they were not submitted to prostatectomy, which is frequently coincident with vasoligature in reported cases, nor was there any other operation of major importance, convalescence from which could be credited with striking constitutional improvement.

"There were a number of others in which vasectomy was an accompaniment of prostatectomy, but, as stated, attention has been called by various writers to the symptoms of regeneration and general physical betterment following the latter operation, raising the question whether or not the causative factor of the resulting favorable condition is the same in both of these procedures."

Dr. Chetwood's report of the four selected cases read very much like Steinach's own memoranda. No. I, operated at the age of 70, is to-day at 73, the picture of robust health, has increased in weight, and attends daily to business routine of exacting demands. No. II, reports that his condition is all

that can be expected of a man of 75 years of age, and dates the present state of his health from his operation six years ago.

No. III, was so old at the time of the operation that Dr. Chetwood doubted his present existence. "Therefore," he says, "I sought information from his medical adviser, asking how long the patient had been dead! 'Dead,' he said, 'he went South the other day to celebrate his 92nd Birthday.'"

No. IV, is too recent to permit definite conclusions.

"Having performed this operation over a period of twenty years," Dr. Chetwood observes, "and having been in communication with all of the patients following operation, I am able to state without reserve that at no time have I observed any complication arising as a result of the operation, or any psychic disturbance develop thereafter.

"This, to my mind, disposes of the fear of detrimental effect, a fear that would naturally delay decision upon any operative procedure if not outweighed by other, more important considerations.

"I would antagonize vigorously the notion that the chief consequences of vasligation are within the sexual sphere, and would denounce the purpose of resorting to the operation solely with this end in view. Double ligature is seldom indicated in a young man, in which cases single ligation may serve as a means to an end.

"As to the effect upon the general vitality, there can be no doubt that there is preponderating evi-

dence that a large number of the cases operated upon show remarkable response to some favorable influence, psychic, antitoxic or endocrinic. This fact, together with the indications outlined in a certain class of cases, should serve at least to justify the claim that vasoligature is an expedient of proved value in the work of the urologist.

“To this may be added the further conviction, after critical survey of the experience of those of high intelligence who have contributed to this experimental field, together with my personal observation, that: senium praecox, an indefinable state of the organism, induced by psychic or physical wear and tear, has, as a result of vasoligature, been succeeded by a reawakening of psychical activity and an improvement in physical vigor that, previous to this operation, seemed beyond reasonable expectation.”

CHAPTER XVII

CASES AND CONFIRMATIONS

MORE confirmations from American sources are added daily to the literature of rejuvenation. Dr. A. L. Wolbarst reports eleven cases to the American Urological Association. Of the eleven patients studied by Dr. Wolbarst, seven were actually senile and four were prematurely senile.

The differentiation between senile and prematurely senile cases was determined by the age of the patient, his general physical condition and his outstanding physiological disturbance. The premature cases deal with men varying in age between forty and fifty-two, prematurely gray, generally weak or "played out," and presenting the predominating symptom of sexual impotence.

Of these seven cases of actual senility, Dr. Wolbarst informs us, five of the men were in a home for aged men and were typical of the decrepit and hopeless inmates of such institutions. The operation was undertaken in the hope that it might result in a stimulation of such gonadal endocrines as still remained in their emaciated bodies. They were not informed at any time what effects were sought to be

produced, but were persuaded to submit to this painless operation in the belief that it might strengthen them and relieve them of their predominant pains and infirmities.

No. I appeared perceptibly younger after the operation.

No. II revealed seven months after the operation, a better general physical condition, lowered blood pressure, improved heart beat.

No. III reports marked lowering of blood pressure and generally good condition.

No. IV was complicated by cancer.

No. V the blood pressure was decidedly lowered.

No. VI died shortly after the operation from other complications.

No. VII improved.

Dr. Hyman Goldstein, visiting physician of the home states: "I find that the color of the skin in these patients was much better, showing improved arterial tone. There was also, evidence of improvement of the metabolic and nutritive processes as shown by the improved muscular tone, and by the feeling of well being. The irregular heart action had been steadied; the blood pressure has been decreased by about 20 to 50 millimeters. There was also a decided improvement in the quality and regularity of the heart beat. There was no evidence of sexual stimulation."

In the four cases of premature senility, the improvement was more noticeable. No. VIII, a

widower of fifty-four, improved so markedly, that six months after the operation, he was advised to "go slow" and not to abuse his regained powers.

No. IX was "satisfactory" according to his family doctor.

No. X reports "fairly satisfactory results."

No. XI notices an improvement in his sight both for reading and for distance.

Dr. Wolbarst looks upon the operation as a "powerful endocrine stimulation and activator." In the actually senile patient, he goes on to say, the most striking result was a marked decrease in blood pressure and a feeling of well-being that is appreciably noticeable. In the senile cases the sexual function seemed to be extinct, almost beyond recovery. It was not influenced appreciably by the operation. In the prematurely senile cases, the sexual function was stimulated materially.

"In view of the fact that it is painless, that it involves no risk, and that there is but little loss of time, there seems to be," Dr. Wolbarst claims, "no reason why, this operation should not be advised in every case of active or premature senility, suggestive of endocrine insufficiency. In young men, the unilateral operation is sufficient for the purpose; in cases where procreation no longer is desired, the double operation is to be recommended as being more effective."

Even more striking are results obtained by Dr. Harry Benjamin, who occupies in the United States

a position similar to that held by Schmidt in Germany. Like Schmidt, he received his inspiration directly from Steinach. Benjamin's personal experience extends to almost one hundred cases, including both men and women. The cases cited hereafter, are gleaned from his medical writings. I omit clinical details:

Case No. I. Clerk of fifty-eight, unmarried. Has been under my care for mental depression, lack of energy and subsequent inability to attend to his duties. His case was one of marked premature senility. He complained continuously of being "dead," "all in" and "knocked out." He was afraid of losing his position.

Organotherapy and drugs had improved his mental condition only to a very slight extent. Without the patient's knowledge, thus excluding auto-suggestion, the Steinach operation was performed in connection with an operation for varicocele.

Five months after the operation, there was an undoubted change in the man's general appearance and behavior, all for the better. There was a healthier look about him, he didn't have that tired, weary and anxious expression on his face, his skin looked more pink, his appetite had improved. As he expressed himself, "I have more 'pep,' I feel like working and have regained my lost ambition." There was a gain of twelve pounds in weight. No change in sexual desire or function.

Case No. II. Merchant, fifty-seven, premature

senility. Seven weeks after operation, patient states that he can walk better than in many years, quicker and with less pain and a much greater distance; he "looks at the world with different eyes."

All his friends have noticed a distinct change in his manner of speech and behavior. His sexual ability has markedly improved, commencing about two weeks ago, which means about five weeks after the operation. Patient looks better, his face as well as his hands seem to have a better "turgor."

CHAPTER XVIII

MORE CASES AND CONFIRMATIONS

THE following extracts from other cases reported by Benjamin in scientific journals are especially important in that they reveal specific improvements, not only of the sex function, but, in several instances, of eye-sight and hearing. The effect on secondary sexual characteristics, such as the growth of hair, is noticable. The author's experience seems to coincide in every respect with the observations recorded by Steinach and Schmidt.

Case No. III. Unmarried College Professor of fifty-five. For the last three years complained of unusual tiredness, lack of ambition, failing memory, general mental depression, "rheumatic" pains in different parts of the body. Since three to four years increasing deafness, so that one had to speak quite loudly to him in order to be understood. His sexual ability and desire had subsided in the last three or four years.

Premature senility, arteriosclerosis of the internal ear. Beginning prostatic hyperthrophy. Patient was on first examination unable to hear my watch tick, even if pressed closely to his ear.

Operation December 28.

January 7, patient feeling generally well. Blood pressure: syst. 128, diast. 76, pulse 76.

February 7 (six weeks after operation) patient reported by letter:

"Some slight symptoms have appeared. The hearing has slightly but unmistakably improved. For the first time, standing close to a chest of drawers on which are two alarm clocks, I can hear the ticking. Before this was never possible. A family whom I visited yesterday remarked that they noticed I could hear better. But the alarm clock test reveals that the improvement, though slight, is unmistakable.

"I also experience a buoyancy and a general feeling of well-being that I have not had for a long time, and many remark that I am looking exceedingly well. I weighed myself yesterday and the figure was 119 pounds. This gain of six pounds, I presume, has nothing to do with that 'temporary' gain during the first week after the operation, but, as I hope, marks the beginning of the lasting effects of the operation. In previous years my weight has not been more than 114 pounds."

April 10. (three and one-half months after operation). Weight 118 pounds. Blood pressure: syst. 138, diast. 95, pulse 60. Patient states that he feels no longer tired, is enjoying a mental buoyancy as not in years, his appetite is better, he has a feeling of well-being, his rheumatic pains have greatly

improved, his sex instinct is slightly but distinctly stronger and his hearing, although subject to changes, is better.

April 17. Patient can hear the ticking of a watch if pressed closely to his right ear, but not if held at a distance. It is not heard with the left ear.

May 20. Patient feels well, can hear decidedly better, the ticking of the watch is heard in one inch distance from the right ear, but on the left side only if pressed closely to the ear. Weight; 119 $\frac{3}{4}$ pounds.

The report of Dr. Heimann, an ear specialist, concerning the patient's ear and nose is as follows:

"There is a decided increase for the perception of low sound on both sides until 1 meter distance; no change in perception of high sounds. Patient affirms that he generally hears decidedly better."

Case No. IV. Manufacturer of 48. Premature senility and impotence. Wound healed quickly. Nearly four months after the operation, patient looks splendid and, in spite of having traveled all the time, has gained ten and one-half pounds in weight. He states that he feels more ambitious and mentally more vigorous. His sexual status has changed markedly.

Case No. V. Contractor, fifty-eight years old. Premature senility with sexual impotence. Last examination, five and one-half months after operation showed marked improvement; more ambition and no more mental depression; gain of about six

pounds in weight; appearance much better, complexion markedly improved.

Patient says that he perspires more freely than in former years and also noticed a stronger growth of his beard, as evidenced by necessity of more frequent shaving. His blood pressure (syst.) was around 180; is now 150. Pulse pressure has decreased from 85 to 75. He feels perfectly able to resume business responsibilities which he had dropped for years. Sex desire and ability has increased little, if any.

Here the changes in perspiration, complexion, growth of beard, blood-pressure and skin reaction indicate increased thyroid activity, balancing the constitutional adrenal disfunction, as evidenced by blood pressure and skin reaction.

Case No. VI. Watchmaker, 36 years old. Impotence for the last nine years; premature senility.

Last examination: five and a half months after operation. Decided mental and physical improvement; patient has returned to work that he had discontinued for many months; feels as well and ambitious as ever; more self-assurance; acne on back disappeared.

The patient volunteered two interesting statements: First, he had been using a $2\frac{1}{2}$ " focus magnifying glass for his work which he finds too strong now; second, has to shave every day compared with every two to three days formerly; he claims that his hair is growing "awfully fast."

Sexual impotence is practically cured. Inter-course satisfactory for the first time in the last nine years. He intends to get married.

Here also the thyroidal stimulation is evident, in addition to the increased gonadal activity in accordance with his constitution.

Case No. XVIII, Physician 64 years, beginning senility and arteriosclerosis. Principal symptoms and complaints: Decreasing mental faculties; poorer memory; very irritable; increasing weakness; blood pressure, syst. 195; pulse pressure 85, weight 161.

Operation: June 27; in a letter dated August 5, (about five weeks after operation, the doctor writes: ". . . I began to improve every day after I left the hospital. Have gained in flesh and now weigh 172 in my light weight clothes. I feel that my manhood is very much improved, and I took my blood pressure this morning, syst. 175, and diastolic 120"

(His pulse pressure was 55, as compared to 85). "Everybody tells me I am looking better than when I left for New York."

Case No. XX. Dyer, thirty-nine years old. Impotence. Decreasing sexual ability with frequent mental depression; all treatments unsuccessful. Ten days after operation, a greater activity in his constitutionally inferior gonadal sphere seems already to manifest itself. Five weeks after operation, distinct improvement; unusual sense of well-being; "rheumatic" pains in knees disappeared;

pulse, blood pressure, and skin reaction normal as before operation; can read without glasses much easier than before; sexually, a marked improvement.

Dr. David T. Marshall, recently Steinached in New York City, publicly acknowledged the salutary effect of the operation. Another case which attracted world-wide attention was that of Dr. Adolf Lorenz, the celebrated Vienna surgeon. Lorenz, both in public statements and in writing, testified to the efficiency of Steinach's methods. After many years of privation and suffering in Austria, he was able to carve out a new career for himself in his own chosen field, thanks to the rejuvenating effect of the operation, performed by Professor Blum in Vienna.

In an interview in a metropolitan newspaper, Dr. Lorenz said that he felt ten years younger and that his friends had detected a trace of blond in his otherwise white beard since the operation. Asked in what cases he thought the Steinach should be performed, he replied:

"I see no reason, why the operation should not be performed on men who are growing old and who feel that their power to work is waning. It may not help in every case, but there is no harm in trying. If it does help, so much the better. There is no risk, no unpleasant after effect, and I think men might just as well have it done as not."

CHAPTER XIX

REJUVENATION IN WOMEN

LITTLE clinical information is available on the subject of rejuvenation in women. Dr. Manfred Fraenkel, of Berlin, is engaged in writing a monograph on the subject. Successful results have been attained both in the United States and in Europe, although the imagination of popular novelists somewhat outstrips the reality.

Steinach's experiments have shown that it is no more difficult to rejuvenate the female of the species than the male in animals. Among human beings the question is complicated by divers considerations.

The only American authority presenting formidable data on attempts to renew youth in women is again Dr. Harry Benjamin, the pioneer of rejuvenation in the United States. My recital is guided largely by his observations. In discussing actual cases of rejuvenation, I am entirely dependent on him.

The question of rejuvenating the fairer sex is of absorbing interest. To women youth is even more precious than to men. Yet, for reasons intimately connected with her anatomy, woman's road to the

goal of rejuvenation is more laborious than man's. The problem is more obscure, the technique more difficult, and the time at our disposal more limited. Nevertheless, women have been successfully Steinached.

The female gonads, like the male, exercise a dual function. They produce egg cells to be expelled for the purpose of reproduction and an internal secretion, the female sex hormone. Steinach speaks of woman's interstitial cells as the female Puberty Gland. Its function and composition are, in part, still unsolved mysteries.

The female Puberty Gland cannot be stimulated by surgical means, similar to vasoligature in men. It has no duct that can be severed. The transplantation of young ovaries is possible and has been accomplished, but the general use of this method meets with almost insurmountable obstacles. The ovaries are buried deep in the abdominal cavity. To obtain them from another woman requires a major operation.

In addition to the practical impossibility of acquiring a sufficient supply of female gonads, legal, ethical and aesthetic objections are raised. Transplantation of animal glands, Benjamin admits, is possible, but the result, in human beings, is doubtful.

The Xray method explained in previous chapters, is unobjectionable, ethically, aesthetically and legally. It is also effective. It consists in the exposure of one or both ovaries, under certain conditions, to

Xrays. The penetrating power of these rays in female disorders encountered during the change of life, sometimes called "menopause" or "climacterium," is recognized. Bleedings and tumors have long been treated and cured by this method.

Physicians frequently noticed a remarkable restoration of health in female patients subjected to the Xray. They ascribed the result to the alleviation of local ailments. To-day, we know that these patients were unintentionally Steinached. The Xray stimulated the female Puberty Gland to greater activity, while demolishing the egg-producing cells. The revitalizing effect achieved is analogous to the result of the Steinach operation in men.

However, only an experienced Xray specialist, guided by a physician who is thoroughly familiar with the Steinach method and with the specific case, should undertake the task of revivifying the aging gland. An exposure to the Xray unduly prolonged or too powerful, may destroy, instead of stimulating, the tissue.

Mild exposures, so called "stimulation doses," involve no such danger. In the hand of a conscientious Roentgenologist, the treatment, experts claim, is absolutely safe. It does not injure the ovaries. It need not induce permanent sterility. The reproductive tissue, shriveled under the Xray, is able, under favorable circumstances, to reconstitute itself. I have already referred to Kyrle's experiments in this connection.

The duration of each exposure, the frequency of its repetition, and the decision whether one or both ovaries are to be treated, depends on the circumstances in each individual case. Ordinarily, at least four treatments are needed. The course may be repeated, if necessary. The efficiency of the Xray method is accentuated by certain thermal applications, in accordance with experiments conducted by Steinach and Kammerer.

The menopause puts a stop to the activity of important functions. Eve cannot afford to wait so long for her rejuvenation as Adam. Men of seventy and over have been successfully Steinached. In women of so mature an age, the attempt would be almost hopeless. The most favorable time is the period immediately before, during or shortly after the change of life.

In our climate, experience proves, woman's "dangerous age," her climacteric, is between forty and fifty. This is the time when women suffer most from the first symptoms of incipient old age. If the gonads still function normally, if the endocrine system is still responsive, the result is likely to be most beneficial. The effect in some cases has been miraculous.

In several instances described by the high priest of rejuvenation, Professor Steinach himself: "Lassitude and weariness disappeared. . . . The physical and mental faculties of younger years were restored. A decidedly changed and more youthful

appearance was noted. The facial expression became increased in vivacity. The entire attitude was more lively. The renewed tenseness of the skin ironed out the old wrinkles. The patients frequently avow a pronounced feeling of well being and an increased joy in living."

Nevertheless, due to the intricacies of her structure, woman presents a more difficult problem than man, with greater uncertainty as to results. However, medical science is making great strides. Our knowledge is daily increasing, and even with present limitations there are many women whose patience and daring have been greatly rewarded by Xray treatments.

It is not impossible that some endocrine change, similar to the effect achieved by the Xray, accounts for women who retain their vivacity and their beauty to a ripe old age. Some divine accident of this nature may explain the miracle of Sarah Bernhardt and Ninon l'Enclos.

It is probable that in the future aging enchantresses, desirous of retaining their charms, will combine the Steinach treatment with plastic surgery. Each complements the other. The plastic surgeon accomplishes his end more quickly than the slow process of nature set in motion by the revived Puberty Gland. On the other hand, the natural reserves invoked by the Xray, make the effect of his operation more lasting.

CHAPTER XX

THROUGH THE OLD WIVES' MILL

IN a previous chapter, I refer to the fairy tale of the Old Wives' Mill. Grinding the grandmotherly grist, it reconverts the old ladies into bevvies of youthful beauties. The following six cases tell the tale of women who turned to science to accomplish a similar transformation.

The results of the Steinach method may not give us new wives for old, miraculously transformed; nevertheless, it is often startling enough. Benjamin's case No. 1 is important because the patient, a distinguished educator, was sixty-four at the time of the treatment. Incipient senility manifested itself in her case by an "increasing lack of mental activity." She was "unable to concentrate." Her imaginative powers were "waning." "Mental sterility" sums up her complaint.

There was no disease, though constant sleeplessness compelled her to resort to veronal. Her change of life had occurred seventeen years before the treatment. Under those circumstances, the case did not seem very promising. She was subjected to four

treatments in the February of 1922. The treatment was bilateral, one ovary at a time being exposed to the Xray.

In April the patient felt her brain "clearer." She "slept better than in years." Her work was "more sustained." New ideas came to her "like a flash." In May she reported a marked improvement in memory and in creative ability. She was astonished by her mental and physical endurance. Blood pressure decreased twenty points.

She worked hard the following months, engaging upon a task that previously seemed to overtax her strength. "Nothing can tire me any more," was her comment in August. One year after the treatment, she noticed no abatement of the favorable effect. Her blood pressure remained twenty points below the previous average.

Her improvement set in six weeks after the first treatment, following a brief spell of increased mental and physical fatigue, immediately after she embarked upon the enterprise of recapturing her youth.

Case No. II was less conclusive, because the patient, owner of a fashionable dressmaking establishment in the West, compelled by business reasons to leave New York, was unable to undergo more than one treatment. She was emaciated in appearance, a woman of forty, prematurely exhausted by hard work. She was "always tired," required "ten hours sleep daily." Her supersensitive nerves reacted to every strain in an "exaggerated

manner." Her body was unable to cope with the demands of her mind.

The examination showed nervous wear and tear, but no special ailment. She was given one treatment in August. In April, she writes: "The reaction from the treatment was very gratifying for a while. Several weeks after taking it, I felt wonderfully well, but it lasted only a short time."

Permanent results were unlikely under the circumstances. Her improvement began three weeks after the operation, and lasted one month. The fact that she did not note an immediate improvement seems to exclude the possibility of auto-suggestion. Five months after her one treatment she had gained three pounds. Her blood pressure was ten points lower than at the time of her first examination.

Case No. III, a teacher aged fifty. She complained of "stiffness of her limbs," "pains in the back," "great exhaustion," "weak memory," a "swelling of the thyroid," and "mental depression." In her case one treatment sufficed, due, perhaps to the fact that her menopause had occurred only seven months before she was Steinached.

As in the first case, the immediate effect was increased fatigue. The patient complained of "severe palpitations of the heart," similar in character to palpitations experienced by her after the internal administration of thyroid extract. After three days, however, her heart registered normalcy. Her pains and her stiffness disappeared. She could

"walk without discomfort for the first time in many months." She felt like a "re-energized dynamo."

The medical examination six weeks after the treatment disclosed a lessening of the thyroidal swelling. Some other gland whose work the thyroid had taken upon itself was now functioning normally. Her skin reaction was considerably improved. She noticed a greater "firmness of flesh." People remarked about the favorable change in her physical appearance. She looked "decidedly healthier." Can work "continuously, sometimes for eighteen hours without undue fatigue."

Case No. IV. A widow of fifty-two, experienced her change in life four years ago. She had no physical complaints, except frequent hot flushes and high blood pressure. She had four treatments, in February and March.

Her re-examination in August showed greatly improved skin reactions and a decrease of twenty-five points in blood pressure. Hot flushes were less frequent. She felt "brighter and generally more energetic."

Case No. V. A singer, aged forty-seven, suffered not merely from endocrine insufficiency, but apparently from some psychic impediment or inhibition. She complained of "lack of ambition," "flagging memory," "aversion to work," and "extreme nervousness." Four treatments were administered in April.

In August the patient stated that she was "more

balanced, less emotional." Her blood pressure had fallen from 170 to 145. The skin reaction was somewhat improved. Her memory was still weak and she could not summon up sufficient courage to test her work. In her case psycho-analysis, complementing the glandular stimulation, would probably be advisable.

Case No. VI, with which I conclude, was the most interesting of all. The patient aged forty-eight is a professional dancer. She suffered from no definite complaint. There was no symptom of change of life. However, she lacked energy and was "easily overcome by fatigue." She applied for the treatment because she "needed her full strength in her work." Five "stimulation doses" were administered during the months of March and April.

Six weeks after the first treatment, her husband noted a "marked improvement." Her blood pressure was "slightly lower," her breasts "more firm." Work was no longer a task, but a pleasure. "She looks twenty years younger," her husband declared. He was so impressed with the degree of rejuvenation attained by his wife, that he immediately decided to be Steinached himself.

CHAPTER XXI

UPWARD AND ON

THE evidence presented in this little book justifies the conclusion that Steinach is right. Rejuvenation is a reality, not a dream. We can conjure back spring without paying a forfeit to nature. Our years are not shortened by the new incandescence. Life's candle, it seems, burns not only more intensely but longer.

Social and economic implications lift the subject of rejuvenation out of the medical sphere. It is of importance not only to doctors and sick men, but to the world at large. The average man consults a physician if he suffers from a specific ailment. Knowing that the pharmacopeia enumerates no herb against death, he accepts the discomforts and disabilities of senescence without seeking medical aid. He is entitled to know that a remedy against old age exists.

Rejuvenation is not confined to man. The law that governs animals also holds sway among plants. Adolph Koelsch, experimenting with radium derivatives, rejuvenates the butterfly. He also rejuvenates the cauliflower. In both instances a bio-

chemical change is produced in the centers controlling the reproductive metabolism.

Methods differ. The surgeon's knife, heat, electricity, the Xray, radium, organotherapy, the feeding of gland extracts to the organism, may come into play, alone or in combination. The object in each case is to stimulate the glands. They are the chemists of the body. They control the laboratory of life.

Those who experiment with bio-chemistry must be prepared for surprises. They deal at all times with forces incalculable and elements unknown. Rejuvenation can never be an exact science. The result is as varied as life itself.

The Steinach method with which this study concerns itself primarily affects each individual in accordance with his constitution. Certain effects are rarely achieved. Others are fairly constant. The treatment does not invariably intensify the sex urge. It almost invariably stimulates nutrition and diminishes blood pressure. In cases of low blood pressure, however, a further lowering with subsequent increase has been observed.

Several observers note the growth of new pigmented hair, often darker than the original coloring. This phenomenon is explained endocrinologically by the intimate functional relation between the gonads and the adrenals. The adrenals control the distribution of hair and pigmentation.

The method that restores the fur of the guinea

pig may induce a hirsute renascence in man. It may leave him bald. We have no right to promise a person undergoing the Steinach treatment a new head of hair.

Improved eyesight, increased muscular strength, are often noticed. They are not noted always. Frequently the psychological changes are even more marked than the immediate physiological effect of the treatment.

Even before wrinkles disappear from the face, they may be obliterated from the mind by the new currents of energy poured into the blood by the rejuvenated glandular system. New life streams through the rejuvenated arteries. Man is indeed reborn.

Again there may be no change at all.

Since the charlatan and the sensation monger avidly exploit the subject of rejuvenation, it is necessary to emphasize its limitations. Dr. Blumgarten, in his introduction, dwells on this aspect.

Steinach, himself, always speaks with the utmost moderation. His disciple Benjamin admits that the result in a number of cases, despite favorable conditions, was nil. Much as we are able to learn from successful instances, unsuccessful cases must be carefully recorded and pondered.

No one can explain why the Steinach method sometimes fails to rejuvenate. Evidently, for some reason or other, no proliferation of the interstitial tissue ensues. Perhaps the vitality of the

entire endocrine system is too exhausted to respond to the call of the gonads. The technique of the operation may be at fault. Or some obscure physiological process may neutralize the efforts of the system to recharge its battered batteries.

One fact, however, seems to be clearly established. No patient is injured by being Steinached. Some one may cite in this connection the case of one of Steinach's English patients, Wilson, who, after experiencing a remarkable degree of rejuvenation, died shortly before fulfilling an engagement to lecture on his own case in London.

Wilson's case was used unfairly against Steinach. Wilson, it seems, was one of Steinach's most successful cases. Overjoyed with his renewed vigor, he overtaxed his natural strength and died, not as a result of the operation, but from angina pectoris.

Patients should be advised not to change their mode of life too quickly or too radically after the operation. Otherwise harm may result. The intelligent doctor presupposes an intelligent patient.

Having established the possibility of rejuvenation, the question still remains: Is it desirable? Is it a boon? A woman well advanced in years, a housekeeper who labored all her life to sustain herself and her children, refused to be Steinached.

"What's the use?" she asked. "It would merely mean that I must go on slaving ten or twenty years longer." Her contention is a reflection on our social system. It does not affect the philosophy of

rejuvenation. If we believe life worth living, it is worth prolonging.

Paul Kammerer, Steinach's associate, dwells at length on the ethical aspect of rejuvenation. Shall science scatter the gift of youth to all comers, or shall we demand that the recipient give something in return to mankind?

"The possibility of rejuvenation," Kammerer asserts in his brilliant volume on the prolongation of human life, "will only then become a blessed achievement, if we administer its benedictions to men, who for their part, are aiming to guide humanity upward and on, in its steep climb toward a higher development."

In theory Kammerer's suggestion is admirable. It seems to point the path to the Superman. In practice it is dangerous to permit anyone, bureaucrat, physician or politician, to decide who shall be rejuvenated. Who shall select the fittest? No man is wise or unselfish enough to be the arbiter of life and death.

Mankind will climb "upward and on," to reiterate Bayard Taylor's version of Goethe's immortal phrase, if democracy guides the hand of the physician who dispenses magic draughts from the Fountain of Youth, imposing his negative sentence of death only upon the feeble minded and the unfit.

Rejuvenation must not become the private prerogative of the rich in shekels or in spirit. It must be a jewel attainable by all. Nothing is likely to

arouse more violent antagonism than to create a special privileged class of rejuvenates and to withhold the gift of rejuvenation from others.

America, the land where work is most intense, where the value of time is most keenly appreciated, America which consumes the vital energies of her children at a prodigious rate, America will receive the greatest benefit from Steinach's discovery. America is destined to advance the cause of rejuvenation and to champion its world-wide adoption.

If the 19th Century was the Century of Mechanics, ours, no doubt, will be known as the Biological Age. The last century taught us how to fly. The present century teaches us how to restore youth by tapping the secret reserves of the Endocrine System.

If we save valuable human material by applying the process of rejuvenation impartially to men and women of ripe experience, our dreams of Utopia may come true at last. Like the ancients in Shaw's play, "Back to Methuselah," man will still be subject to accident and to assassination. But we can check those processes of nature which palsy the pilot's hand at his wheel when his wisdom is needed most.

Singers and seers and captains hereafter may fall prey to the malice of fate or to the malice of man: at least they will not wither, premature victims of the toxins bred in their body. Nature, which implants the poison within us, also supplies a powerful antidote in the marvelous secretion of the Puberty Gland.

Within ever expanding limits, bio-chemistry will hereafter direct the trend of eugenics and evolution. Even beyond that, our vision soars. If we can rejuvenate men and women by a slight surgical operation or by the application of Xrays, why is it not possible for Science, as our knowledge of the Endocrine System waxes, to distil some day, somewhere, somehow, the elixir of eternal youth? If we halt the insidious advance of Age, may we not, in time, challenge Death? . . .

STEINACH VOCABULARY

Acromegaly: Nervous ailment, characterized by gradual enlargement of the head and of the extremities, due to disease of pituitary gland.

Adrenal Gland: Sometimes called suprarenal; situated above kidneys; most important as source of energy, controlling, to a large extent, blood pressure by formation of adrenalin; determines pigmentation and distribution of hair.

Angina Pectoris: A harassing disease, so named from a sense of suffocation induced by contractions of the blood vessels nourishing the muscles of the heart.

Arteriosclerosis: Hardening of the arteries.

Atrophy: Shrinking of tissue.

Autoplasm: Living tissue from the same body, as for instance skin transplanted from a patient's back to his face.

Bio-chemistry: The chemistry of life.

Bilateral: Pertaining to both sides.

Bi-sexual: One whose sex urge or libido is directed toward both sexes; one whose endocrine constitution and nervous associations are mixed; an animal or a person having both male and female sexual characteristics, a hermaphrodite.

Castrate: To emasculate; to destroy the reproductive function in either sex; to create a eunuch.

Complex: Term used in psycho-analysis to denote a cluster of mental or nervous associations.

Cretinism: A form of idiocy, frequently accompanied by deformities such as goiter, due to thyroid insufficiency.

Diastole: Rhythmic expansion of the heart and the arteries.

Duct: The canal through which a gland discharges its specific secretion.

Ductless Gland: A gland that pours its secretions directly into the blood or lymph.

Dynamometer: An instrument to measure muscular resistance.

Endocrine System: The glands of internal secretion.

Erotization: The action of the sex hormones on the organism; it determines the degree of sex tension and induces distinct sexual characteristics, such as the fighting and wooing instinct in males, and the nursing or mother instinct in females.

Eunuch: A distinct type, induced by the disfunction or removal of the gonads, as in the capon or in the gelding; approximating the infantile; emasculated, castrated, unsexed.

Ganglion: Nerve center from which nerve fibres radiate.

Gland: Organ for secreting bio-chemical substances to be used in, or eliminated from, the body.

The essential elements of a gland are cells which select from the blood and, in many cases, modify, the chemical compounds which constitute its secretions. A gland may have a mouth which is called a duct, or it may be ductless.

Gonad: That which generates; the sex gland; a mixed gland, producing both external and internal secretions. The term, used indiscriminately of either sex, may refer to ovaries or to testicles.

Histological: Relating to the microscopic structure of the tissues.

Homoplasm: Living substance implanted from another similar body, as skin volunteered to save the life of another.

Homosexual: As opposed to heterosexual; a person whose sex urge or libido is directed toward his own sex; one whose endocrine constitution and nervous associations contradict his or her anatomical classification. "Homo" is derived from the Greek term for "like"; "hetero" from the Greek root for "unlike."

Hormone: The name given to the internal secretion of any gland, from the Greek word to "rouse," to spur into action. These bio-chemical agents dominate the development, configuration and growth of the body. If one link in the endocrine chain (thyroid gland, suprarenal capsule, gonads, pituitary, etc.) is diseased or deranged,

severe disturbances in the shape, size and function of the body ensue.

Hypertrophy: Abnormal enlargement.

Impotence: Psychic or physical inability to complete the sexual act.

Insulin: Specific against diabetes; derived from cells producing the internal secretion of pancreas.

Interstitial Gland: Synonym for Puberty Gland, so named because it is found between the spaces or interstices of the cells constituting the Reproductive Gland.

Inversion: Direction of libido contrary to anatomical sex classification; innate homosexuality induced by paradoxical function of gonadal hormones.

Leydig Cells: Chief constituents of the Puberty Gland, principal producers of the sex hormones.

Libido: The sex urge, a term derived from the Latin, used especially in psycho-analysis. Denoting originally "lust," the word has been expanded by Freud to such an extent that it includes every physiological or psychological manifestation connected even remotely with sex.

Mammary Gland: Milk producing glands of mammal; breasts, udders, teats.

Menopause: Woman's climacteric period, marked by the cessation of periods; change of life.

Metabolism: The chemical process by which life

is sustained, the building up of tissue from the food and the elimination of waste.

Myxoedema: A disease producing dullness and slowness of speech due to deficiency of thyroid gland.

Organotherapy: Treatment of disease by the administration of portions of animal organs or their extracts.

Ovaries: The female gonad or sex gland, producing the egg cells and an internal secretion, the female sex hormone.

Oxydation: Process by which oxygen is consumed by the system.

Pancreas: Mixed gland like gonads, situated in abdomen; its external secretion furnishes important digestive juice; its internal secretion furnishes hormone regulating sugar metabolism.

Peritoneum: Membrane lining abdominal cavity and most of the organs contained in the abdominal cavity.

Pharmacopeia: A standard compendium of medical remedies and preparations.

Pigmentation: Distribution of coloring matter.

Pineal: Gland situated in brain, believed by ancient Greeks to be seat of the soul; its functions are obscure; it is supposed to participate in control of growth and mental development; the Pineal may be the vestige of an abortive eye in the middle of the head; this supposition would ex-

plain the fact that it seems to influence susceptibility to light.

Pituitary Gland: Also called hypophysis; situated near base of brain in small bony compartment; controls growth, therefore responsible for giant as well as for dwarf. Derangement of pituitary frequent source of migraine. Determines rhythm and periodicity.

Plastic Surgery: Branch of surgery which heals or reshapes diseased or deformed parts of the body; plastic surgery removes wrinkles, straightens out noses, transplants skin, etc.; highly developed during the World War, it has succeeded in literally rebuilding faces hideously disfigured.

Procreation: Sexual reproduction; act of begetting young.

Proliferation: Unusual or excessive production of cells.

Prostate: Gland surrounding the bladder, producing a fluid which constitutes an important ingredient of the sexual discharge. The spermatozoa are suspended in the prostatic fluid, which keeps them alive.

Prostatectomy: A cutting away of the prostate gland, wholly or in part. In old age, the prostate has a tendency to enlarge.

Protoplasma Hysteresis: Continuous and progressive condensation in the substance of living matter.

Psycho-analysis: Originated by Professor Freud of

Vienna, is the science that leads man through the mazes of his subconscious self. It is the thread pointing the way out of the labyrinth where his repressed desires, like fabulous monsters, lie in ambush to pounce upon him in his unguarded moments.

Puberty Gland: A sub-division of the gonad; its organ of internal secretion; the gland that determines the sex impulse and secondary sexual characteristics; producer of sex hormones.

Rejuvenate: Noun, a person successfully Steinached; any one in whom senility is retarded and an organic condition, analogous to that of youth, induced by rallying the bio-chemical forces regulating metabolism.

Reproductive Gland: A sub-division of the gonad; its organ of external secretion; the gland that insures the perpetuity of the race; producer of spermatozoa.

Ripper: Homicidal maniac whose diseased sex instinct is associated sometimes with religious mania, seeking sexual satisfaction in slashing or murder. The most famous representative of this type of insanity was Jack the Ripper, who infested Whitechapel, London; guilty of many outrages on women; his identity was never established.

Salivary Gland: Situated in mouth, producing saliva or spittle.

Scrotum: The external bag containing the testicles.

Senescence: State of growing old.

Senility: Old age or its infirmities.

Senium Praecox: Premature senility, owing to psychic or physical wear and tear.

Sertoli Cells: Found in the histological structure of the seminal canals. It is believed that they share with the Leydig cells in the formation of the sex hormones. It is possible that they take part in the formation of spermatozoa.

Sex Hormone: The bio-chemical agent which constitutes the internal secretion of the sex gland or gonad.

Sperm: Semen, Seed.

Spermatic Cord: Structure from which the testicle is suspended, containing blood vessels, nerves and the vas deferens.

Spermatozoa: The product of the testicle, microscopic "animals," constituting the life-giving element of the sperm. Fertilization is accomplished by the union between the male spermatozoa and the feminine ovary or egg cells.

Steinach: Verb, to rejuvenate by Steinach method; to energize internal secretions by reviving the aged or prematurely exhausted Puberty Gland.

Steinach: Noun, synonym for Steinach operation, to perform a "Steinach."

Steinach Operation: A combination of vasectomy and vasoligature.

Sterility: In males, absence of spermatozoa in the sexual discharge: In females, absence or dis-

ability of ovary or egg cells. These elements are necessary for the purpose of reproducing the species. They are not necessary for the sexual act.

Stimulation Doses: Applications of the Xray so carefully calculated that they energize, without destroying, the tissue.

Suppuration: Formation of pus.

Suprarenal: Synonym for adrenal.

Systole: The contraction of the heart and arteries by which the blood is forced upward and the circulation maintained.

Testes: Plural of testis, Latin for testicle; the male gonads.

Testicles: The male gonad or sex gland, producing both spermatozoa and an internal secretion, the male sex hormone.

Therapeutic: Of or pertaining to the art of healing.

Thermal: Pertaining to heat.

Thyroid: Gland situated astride the neck, close to windpipe. Most important gland of internal secretion; capable of compensating deficiency in other glands. Mobilizes energy; controls endocrine equilibrium; determines quality, supplies system with iodine.

Thymus: Gland dominating childhood, situated behind breast-bone; usually disappears with puberty; persistence of the thymus after puberty is likely to induce infantile characteristics in mature organism.

Turgor: Appearance and tension of skin.

Unilateral: Pertaining to one side.

Vas Deferens: The duct of the Reproductive Gland; also called spermatic duct. A vas deferens leads from each testicle through the spermatic cord to the external organ of generation. Hence the Steinach operation may be performed either unilaterally or bilaterally.

Vasectomy: Re-section or excision of a part of vas deferens.

Vasoligature: Binding or restriction of the vas deferens.

WHO'S WHO IN REJUVENATION

ABDERHALDEN, E., M.D., Halle, Germany. Student of bio-chemistry.

ATHERTON, Gertrude, American novelist; used the Steinach method as the theme for her novel, "Black Oxen."

BIEDL, Arthur, M.D., Professor at University of Prague. One of the foremost authorities and author of a basic treatise on the ductless glands.

BENJAMIN, Harry, M.D., Endocrinologist, New York. Chief exponent of Steinach method in the United States; author of important articles on the subject in "New York Medical Journal," "The Journal of the Medical Society of New Jersey," "American Medicine," "Endocrinology," etc.

BERMAN, Louis, New York, Author of "The Glands Regulating Personality."

BERTHOLD, Paul, M.D., An early German investigator of the effect of internal secretions of sex glands on the development of secondary sexual characteristics.

BLAIR, Bell, M.D., a prominent English gynecologist. Author of a treatise on the female sex glands.

BLUM, Victor, M.D., Vienna. Author of medical publications. Surgeon who performed Steinach operation on Professor Adolf Lorenz.

BLUMGARTEN, A. S., M.D., Associate Attending Physician to Lenox Hill Hospital. Endocrinologist, author of medical text books and other important publications. Leading exponent of organo-therapy. Chief of Endocrine Department of the Lenox Hill Hospital.

BRINKLEY, John R., M.D., American surgeon; author

of publications on rejuvenation experiments. Specialist in transplantation of goat gland.

BROWN-SÉQUARD, Charles, M.D., Paris, French predecessor of Steinach. Pioneer of experiment with gonadal extracts for the purpose of rejuvenation.

CHETWOOD, Charles, M.D., Professor of Urology. Author of Textbook on Urology and numerous monographs.

CHENEVIERE, Jacques. French novelist. Author of "Jouvence ou la Chimère" dealing with the problem of rejuvenation.

COTTE, I., M.D., Paris, author of researches on genital hormones.

ENGLEBACH, Wm., M.D., St. Louis, President of the Association for the Study of Internal Secretions. Author of numerous articles on the ductless glands.

FALK, F., M.D., Brazil, has reported a number of successful cases of Steinach operation.

FALTA, Wilhelm, M.D., Endocrinologist in Vienna. Author of a treatise on the ductless glands.

FRAENKEL, Manfred, M.D., Berlin, Roentgenologist; Pioneer in application of Xray to Endocrinology. Author of numerous contributions to medical literature.

GOHRBRANDT, E., M.D., Berlin, author of articles describing the effect of vasoligature on the testes.

HAJEK, F., M.D., Prague. Colleague of Ruzicka; notable experiments in protoplasma hysteresis.

HARMS, W., M.D., German scientist; pioneer in rejuvenation experiments.

HARROW, Benjamin, Lecturer on Physiological Chemistry, Columbia University, New York. Author of book "Glands in Health and Disease" in which rejuvenation experiments are discussed.

HIRSCHFELD, Magnus, M.D., Head of the Institute of Sex Science, Berlin. Expert on sex variations, standing midway between Freud and Steinach.

Author of many important contributions to the science of sex.

HOLZKNECHT, Guido, M.D., Professor of Roentgenology, Vienna; collaborator of Steinach; author of important publications on rejuvenation by exposure to Xray.

HOSKINS, R. G., M.D., Professor of Physiology, Ohio State University, Columbus, Ohio, Editor of Endocrinology. Author of numerous articles on experimental work on the ductless glands.

HUNT, H. Lyons, M.D., Specialist in plastic surgery and gland transplantations. Author of monographs on the subject.

KAHLENBERG, Hans von, German novelist whose fantastic tale, "The Secret of Pauline Farland" is based on Steinach's discovery.

KAMMERER, Paul, Ph.D., Biologist, zoologist and philosopher. Lecturer on Zoology at University of Vienna. Most prominent collaborator of Steinach. Author of many books and monographs. His book entitled "Rejuvenation and Prolongation of Human Efficiency," is his most notable contribution to this special field.

KOELSCH, Adolph, Student of radio activity on sex and growth in animals and in plants. Author of "Miracles Within Us."

KRABBE, Knut, M.D., Copenhagen, Author of numerous articles on the sex glands.

KUNTZ, A., M.D., St. Louis, Mo. Department of Anatomy, St. Louis University School of Medicine. Author of several monographs on Interstitial Gland.

KYRLE, J., M.D., Important experiments on gonads of dogs. Established the fact that the Xray need not destroy the reproductive function.

LIPSCHUETZ, A., M.D., Professor at Dorpat University. Author of "The Puberty Gland"; distinguished adherent of Steinach.

- LESPINASSE, V. D., M.D., Chicago. Illinois Surgeon. Author of important medical contributions on the function of the sex gland and transplantation.
- LICHTENSTERN, Robert, M.D., Surgeon-Urologist, Vienna. Prominent collaborator of Steinach. Author of important studies on the result of the Steinach operation.
- LYDSTON, G. F., M.D., Chicago. American pioneer of gland transplantation methods.
- LORAND, A., M.D., Karlsbad, Czecho-Slovakia. Author of well-known books on old age and rejuvenation.
- LORENZ, Adolph, M.D., Famous orthopedic surgeon. Vienna and New York. Underwent Steinach operation, openly attesting its efficacy.
- MARINESCO, M. G., Paris, author of a number of articles criticizing the Steinach operation.
- MARSHALL, David Trumbull, M.D., New York. Eye Specialist. Recently Steinached by Benjamin to reduce high blood pressure, publicly avowed satisfactory results achieved in his case.
- PENDE, N., M.D., a prominent Italian Endocrinologist. Author of a book on Endocrinology and numerous articles on the ductless glands.
- RARTZIN, A., M.D., Buenos Aires, has studied the effect of the Steinach operation on dementia praecox.
- ROBINSON, William J., M.D., New York, leading exponent of sex reform and eugenics. Editor of "Medical Critic and Guide."
- ROUX, Wilhelm, Germany. University Professor in Halle. Authority on the mechanics of evolution to whom Steinach dedicated his book on Rejuvenation.
- RUZICKA, Vlad, M.D., Prague. Professor at University of Prague. Proves rejuvenation by examination of cell protoplasm. His theory of protoplasma hysteresis or "progressive condensation of tissue," elucidates the problem of age and death.
- SAKAKI, M.D., University of Tokio. Important medi-

cal contributions on the effect of Steinach operation.
Chief exponent of Steinach in Japan.

SAND, Knud, M.D., Copenhagen. Monographs on Steinach operation on human beings and animals.

SCHMIDT, Peter, M.D., Berlin. Surgeon and chief exponent of Steinach method in Germany. Author of "Theory and Practice of the Steinach Operation" and numerous medical articles.

SISSER, Hans, M.D., Endocrinologist, San Francisco, Cal., author of numerous articles on the ductless glands.

STANLAY, L. L., M.D., St. Quentin, California. Specializes in gland substance implantations.

STANTEY, L. L., M.D., Resident Physician, California State Prison, San Quentin, California, has reported a series of 1,000 cases of transplantation of the testes in criminals.

STEINACH, Eugen, M.D., Professor of Biology, University of Vienna. Director of Biological Institute of former Imperial Academy of Sciences. Author of "Rejuvenation by Revivifying the Aging Puberty Gland" and numerous monographs on internal secretion of gonads. Recognized authority in this special field. Originator of vasoligation for the purpose of rejuvenation known as "Steinach Operation."

THOMALLA, Curt, M.D., Berlin. Leader of Producing Staff of the famous Steinach film depicting in motion pictures the researches of Steinach and clinical effect of the operation.

TIERNEY, I. L., M.D., Endocrinologist, St. Louis, author of numerous articles on the ductless glands.

TIMME, Walter, M.D., New York City, Endocrinologist, author of numerous articles on the ductless glands.

UHLENHUTH, Eduard, Ph.D., Rockefeller Institute, New York. Author of important contributions on feeding glandular extracts to animals and the effect on their development.

VECKI, Victor G., M.D., San Francisco, California. Author of articles on rejuvenation and effects of Steinach operation.

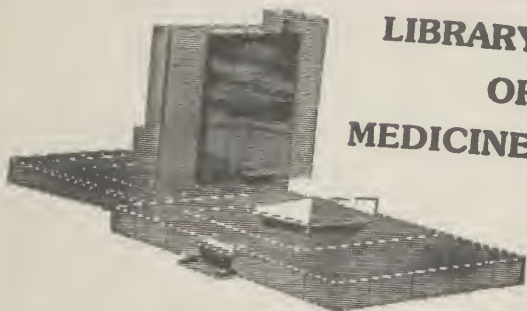
VORONOFF, Serge, M.D., Paris. Chief exponent of transplantation methods for the purpose of rejuvenation. Specializes in monkey glands. Author of "Life" and many articles in medical journals.

WEIL, Arthur, M.D., Endocrine specialist of Sex Science Institute at Berlin; author of significant contributions to Steinach theory.

WILHELM, Ottmar, M.D., Santiago, Chile. Author of important monograph on rejuvenation by the Steinach method.

WOLBARST, Abraham, M.D., New York. Urologist. Author of Medical Studies on Rejuvenation by Steinach method.

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